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APRIL 1978 #1

FUTURE

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Artist Chesley Bonestell's 1956 vision of preparing the Mars glider in Earth orbit (pg. 66)



ISAAC ASIMOV: Life In The Future
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FUTURE

The Magazine of Science Adventure

APRIL 1978 #1

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On The Cover: Originally used as an illustration in the 1956 book *Exploration of Mars* (written by Willy Ley and Wernher von Braun), this magnificent Chesley Bonestell rendering shows the assembly of the Mars glider and relief ship (foreground) in preparation for the expedition to Mars. This view is 1,075 miles above the west coast of South America, and the group of islands visible below the near wing of the glider is the Galapagos. This painting was graciously loaned to us for the premiere cover of FUTURE by the proud owners, Mr. and Mrs. F.C. Durant, III.

Art Staff: Laura O'Brien, Ted Enik. **Production Assistants:** Rita Eisenstein, David Hirsch, Dan Battles. **West Coast Staff:** Scot Holton, Bob Skotak. **Contributors This Issue:** Isaac Asimov, Rick Baker, Charles Bogle, Chesley Bonestell, William J. Cromie, Ted Enik, Roger Hill, George Howell, Joseph Kay, Judy Macready, Gregory McQuarter, Fred Pohl, Mark Spangler, Rich Sternbach, Three Tyler.

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The future is racing toward us. A few moments after we glimpse it on the horizon, it appears at our doorstep. Everyone who has picked up this new magazine is probably the kind of person who flings his door wide, eager to welcome the changes the future brings, but there are those who fear and resent the future. Their are those who slam their doors.

* * *

On November 22, 1977, twin supersonic transports (SST's), named Concorde, landed almost simultaneously in New York City. One had come from Paris, the other from London. Both had completed the entire journey in less than 3½ hours—actually arriving *earlier* (by the clock) than when they had left. It was a spectacular achievement in passenger aviation and an event which the first overseas passengers of 1930 (when Paris to New York took 37 hours) never dreamed could happen.

Most of the crowd at JFK airport cheered the arrivals as the dawning of a new faster-than-sound era of transportation. To them this was another step in shrinking the globe and bringing the peoples of our planet literally closer together. It was another step in extending Man's control of nature and bettering his life. It was a clear step toward the future. But there were those who *booed* the arrivals

Since the Concorde was first announced as operational, about two years ago, countless protests, traffic snarl-ups and vehement demonstrations had been staged to voice objections to the new plane's landing in New York. Lawyers were hired by the protestors, meetings convened and government agencies and officials were bombarded with requests to prevent the Concorde from landing. Some objections had scientific reasoning behind them, and while heated debate laid most of the fears to rest, there are still some serious reservations to be dealt with. Cautious examination is part of the process of progress, and we are *not* advocating a foolhardy rush toward anything new. The kind of battle that has gone on for two years is generally a healthy activity.

But the loudest objections were based on *noise*. Nearby residents claimed the SST would be many times louder than conventional aircraft, but when a test landing was finally allowed, noise-measuring devices showed the decibels to be less than predicted—even less than other planes. Faced with these facts,

protestors insisted to TV reporters, "It was a *different* kind of noise . . . it was new and *awful*!"

Clearly, the resentment went deeper than the ears of the beholders.

The day after the triumphant twin landings, Pete Hamill, columnist for the New York Daily News, wrote a story lamenting the battle lost by the "ordinary people" to "the Great God Progress." Instead of dealing with the serious issues, Hamill revealed the ugliest form of resentment to progress.

After painting a picture of the Concorde *passengers*, using phrases like, "... tight, glossy, clean-shaven faces . . . of people made fat with francs and pounds . . ." Hamill described the Concorde as having "a kind of ominous beauty . . . like some large malignant tern, about to strike swiftly at the huddled ants who stood beside the airport building." But his most revealing phrase was, "Those ants were working people, and the Concorde was not designed for them. It was designed as a limousine service for the corporate rich."



Twenty years ago I was too young to pay any attention to columns like this, but there were probably "ant heroes" then who protested *color TV sets* simply because they were new and too expensive for anyone but the rich to afford. My family couldn't afford one at first, but I didn't resent those who could. Even then, I understood that the more rich people who bought color TV sets, the lower the prices would go until finally I would be able to buy one for myself.

And that, of course, is the way it *always* works. The rich are the ones who pay for the expenses of research and development by purchasing high-priced products fresh out of the laboratory. When the research investment has been paid for, the manufacturer is able to lower the price to a level affordable by us "ordinary people."

The rich have made it possible for *almost everyone* to afford color TV,

and the rich will make it possible, someday, for me to take a 3½ hour ride from New York to Europe (right now that costs over \$900, one-way). Mr. Hamill needs to be reminded that 25 years ago "ordinary people" could never have dreamed of flying to Europe *at all!* Only the rich could, and thank heavens they did.

Because today it can cost as little as \$100, one-way on standard carriers, and even our office mail boy can afford that. And *did*.

When the future first arrives, it is *costly* because nothing wonderful gets put together for free. But thanks to the inventors who produce irresistible things, the critics who examine the benefits and problems, and the rich who are willing and able to pay for the research and development—eventually the future arrives at *everyone's* door.

* * *

Through the pages of this magazine we will do more than look at the future—we will rush forward to meet it and to examine it close up. Join us on this journey and we promise that your fellow passengers will be the most outstanding companions you could wish for.

To prove this point, Chesley Bonestell, the magnificent, legendary artist, christens FUTURE with his cover painting and some personal comments and pictorial visions of exploring the universe. There is no more appropriate person to indicate the theme of FUTURE, and we are tremendously honored.

Also aboard: Isaac Asimov, the world's best-known and best-loved science visionary, who inaugurates our "Tomorrow" feature; Doug Trumbull, special effects creator for *Close Encounters of the Third Kind*, who shares some of his movie secrets and tells us of his exciting future projects; author, editor, thinker, Fred Pohl, the first of our literary interviews, who sums up his overall view of science fiction and the future he sees for the field; Jesco von Puttkamer, noted NASA expert, who conducts the first of many tours into the wonders of the space sciences.

Our regular staff—editors, writers and artists—have combined their talents and knowledge to create the concept and format of this new publication—a magazine (like the ad says) for *everyone who looks forward to tomorrow*.

Thanks for opening *your* door to FUTURE. Prepare for launch

Kerry O'Quinn/Publisher

input

FUTURE LIFT-OFF

. . . Best wishes for the success of your new venture.

Neil A. Armstrong
Professor of Aerospace Engineering &
Applied Mechanics
University of Cincinnati
Cincinnati, Ohio

BEST WISHES FROM BONESTELL

. . . I certainly wish you all the best in your new magazine venture, FUTURE. It sounds as if it will have great appeal, for it is a theme which has always fascinated mankind: What does the future hold? I'm looking forward to the first issue, which Hulda (Mrs. Bonestell) says is sure to swell my already jumbo ego!

Chesley Bonestell
Carmel, California

Letters for this first INPUT column were received by STARLOG, our companion SF-media magazine. However, in terms of content and questions, they are representative of the scope of the subject matter presented in this issue and forthcoming issues of FUTURE. Please address all correspondence to:

FUTURE Input
475 Park Avenue South
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New York, N.Y. 10016

All comments, questions and suggestions are appreciated, although personal replies are impossible. Those letters of general interest may be selected for publication in future issues.

SF LITERATURE SLIGHTED

. . . Almost all the science fiction "media" magazines I run across are totally one-sided. It seems as if they only type of science fiction people want to read about these days is the watered down stuff that winds up on television and in theaters. How about giving some of the real science fiction fans a break and devoting a little space to the men responsible for the genre in the first place . . . the writers. I realize that they are not as flamboyant looking as ten-foot-tall Wookies, or as charismatic as pointed-eared crewmembers, but if it weren't for these ordinary fellows that sit behind typewriters all day . . . Star Trek might still be on the drawing board and Star Wars would be a trailer film for *American Graffiti*. Please! These men invented it, for Pete's sake. Let's give them a little attention.

Nathaniel Wallenstein
Brooklyn, New York

We hope to do just that in the pages of FUTURE. In this issue, and in issues to come, we will be talking to some of the foremost names in the field of science-fiction literature. We will find out their thoughts concerning topics related to both science fic-

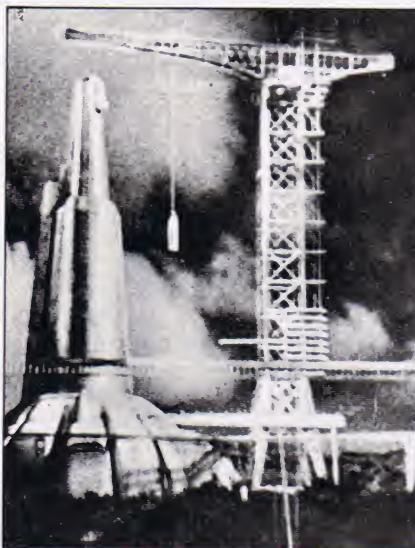
tion and science fact. FUTURE will also preview new hardcovers, paperbacks and periodicals in our In Print section. In addition, our FUTURE Forum section will regularly feature question-and-answer sessions with some of SF's more familiar faces, in the fields of literature, film, TV and science. We hope that will keep all science-fiction fans satisfied.

SAVE LOGAN

. . . I would like to call on all science fiction fans, especially those who are fans of *Logan's Run*, to write to CBS at 51 West 52nd St., New York, New York 10019, att: Program Department. *Logan's Run* goes off the air in February, signalling the end of *Wonder Woman* and *The Man From Atlantis*, if they haven't been cancelled by now. I enjoy *Logan's Run* very much and make it a point to be home on Monday nights to watch it. I'm not saying *Logan's Run* is a perfect show. Many improvements should be made. But CBS isn't going to let this happen. Why should we allow 1,200 people to tell 75 million households what we should watch?

Michael Smith
Orlando, Fla.

While we don't exactly follow your logic, we can see that your heart is in the right place.



COMING SOON

. . . Is there any chance you might do an article on *Things To Come*? It's a super film.

Joan Taylor
Paco River, California

FUTURE plans to do retrospective features on many science-fiction classics, Joan, starting off with this issue's behind-the-scenes look at *The Man From Planet X*. Our next article of this nature will indeed concern itself with the milestone motion picture *Things To Come*.



TOLKIEN TROUBLES

. . . I am in a state of complete confusion. I have read many books on J.R.R. Tolkien and how he came about writing *The Hobbit* and *The Lord Of The Rings*, but all of them tell a different version. For instance, in one book it says Tolkien translated it from an ancient text called *The Red Book of Westmarch*. Yet, in another, it says he fantasized it in his childhood. Does anyone know what really happened?

Christopher Slaughter
Bristol, Va.

It won't take Gandalf's magic to solve this problem. J.R.R. Tolkien's accounts of Middle Earth in both *The Hobbit* and *The Lord Of The Rings* were fantasy epics entirely of his own making. *The Red Book Of Westmarch* was a fictionalized source book created by the professor for the introduction to *The Fellowship Of The Ring*. The imaginary reference work was supposedly begun by Bilbo Baggins after returning from his bout with Smaug the Dragon, and designed to give Tolkien's epic tale of hobbits and dwarfs a ring of authenticity. What better reference for a fantasy than an imaginary book?

PAP

. . . Regarding CBS's *Space Academy*, the scripts are mediocre and the actors are stale. Ric Carrott and Pamelyn Feidin actually look Barbie and Ken dolls! The only good thing in the show so far are the special effects, Jonathan Harris and, in a recent episode, a most welcome guest appearance by Robby the Robot. As one local critic put it, "The most serious fault with the show is that it is conceived as a 'kid show' and so, consequently, watered down to tasteless pap. The premise and effects are both good, but they are overshadowed by the monotone dialogue and cornball plots. Should the producers (continued on page 51)



Six year old David, suffering from an immuno-deficiency, dons his NASA-developed space suit to give his mother a hug.

NASA SPACE SUIT SAVES INCURABLE

Scientists at NASA's Johnson Space Center near Houston are convinced that technology designed for use in outer space can be applied to medical problems here on Earth. Working with the staff at Texas' Baylor College of Medicine, they have devised a modified space suit that will seemingly do the impossible: provide a portable germ-free environment for a six-year-old child with no immune protection whatsoever against common diseases.

The recipient of the suit, David, was born with an immuno-deficiency disease. Shortly after his birth, doctors were unable to perform the necessary bone marrow transplant needed to correct the condition, since a donor with a compatible marrow-type was not available. The doctors decided that, until a donor could be found, the only way to keep David alive was to house him in a germ-free plastic bubble at the Texas Children's Hospital in Houston.

The search for a donor continued without success while David grew in his bubble world. Gradually, the child

began splitting his time between living in the hospital bubble and a portable bubble constructed in his home. His parents noticed that not only was David a healthy, normal child but a psychologically advanced one as well. Now, at age six, David is a history maker. He is the only human being to exist for so long a period of time in an artificial environment. He is also progressing rapidly in reading, math, art, music and other subjects. And soon, for the first time in his life, David will be able to see the world outside his dome.

NASA and Baylor College's miniature space suit is attached to a pushcart air support system, allowing its wearer to move around freely. Based on the suits used on the Apollo lunar flights, it resembles the ones used by returning astronauts during their quarantine period on Earth. It's made from rubber (of a similar nature to the material used on life rafts), with specially form-molded rubber gloves and shoes. It's topped by a spacey, clear plastic bubble that covers the head. Exhaust vents are attached to the legs.

David journeys from his stationary

STAR WARS II STAR TREK II

Work has begun on sequels to two of the most influential science-fiction productions to appear within the past decade: *Star Wars II* and *Star Trek II*. Both films should be reaching their audiences in the next twelve to eighteen months.

In the realm of the *Wars*, George Lucas has approached all of the original film's principals, including Mark Hamill, Harrison Ford, Carrie Fisher, Peter Cushing, Alec Guinness, Dave Prowse, Peter Mayhew, Anthony Daniels and Kenny Baker. Noted SF author Leigh Brackett has been approached with the task of writing the screenplay for the big-budgeted sequel. One of the key elements in the second script may be the origin of the Dark Lord, Darth Vader. One version of his life being considered for the forthcoming production will reveal a young, handsome Darth turning rogue Jedi,



Star Trek II's production illustrator, Mike Minor, displays the new *Enterprise*.

Photo: David Hutchison



bubble home to the germ-free suit via one of the two tubes attached to the outfit. The tube then collapses and is stored on the pushcart. The second tube allows filtered air from the pushcart into the suit. Once inside the suit, David is capable of traveling on foot wherever he would like to go. Or, if he prefers, a seat on the pushcart allows him to "drive" from place to place.

Thus far, David has worn the suit three times successfully. In the presence of his parents, NASA officials and doctors, he has wandered around his hospital room, riding elevators, playing catch and visiting other patients. David's parents hope that, soon, the suit will enable their son to visit the zoo, NASA and other locations of interest to a six-year-old.

NASA is very pleased with its \$25,000 investment in the field of Earth medicine. Should the suit prove equal to David's newfound kinetic lifestyle, both space scientists and doctors feel that it would also prove a great help to young leukemia patients who need to be similarly isolated from germs for short periods of time. □

Photos Courtesy of NASA



At the top of the page: David's sister pushes the oxygen-supplying cart with her brother as passenger. Above: David records his voice from within his germ-free portable environment. His suit was patterned after the Apollo space garb.

killing Luke Skywalker's father and being pushed into a pool of molten lava by avenging angel Ben Kenobi. Darth is so badly scarred that he dons his black armor forever. It serves as a combination exoskeleton and walking iron lung. The second version portrays Darth as being, in reality, Luke Skywalker's father. After a psychological trauma, Luke's father succumbs to the darker nature of The Force and allows all that is good within him to die. And rising from the ashes of his soul is Darth, the arch-foe of all that is righteous. Whatever Vader's fate in the as-yet-embryonic script, the film began pre-production in London in January.

Further down the production line is *Star Trek II*. Originally slated for the spring of '78 as a syndicated TV series, Roddenberry's *Trek II* is now in production as a feature film presentation, scheduled for Christmas release of this year. With a budget hovering between \$10 and \$15 million, *Trek II* begins

principal shooting in March with special effects (helmed by Bob Able) already some months in the works. Although the final script has not been completed as yet, word has it that in this *Trek* outing, Kirk and his crew will come across a 70-mile long "living" alien robot space vessel. Paramount, by the way, is still talking about bringing *Trek II* to the tube on a weekly basis but has postponed any thought of that reality until at least one year after the release of the motion picture. In that case, *Trek* fans may have to wait until the spring of 1980 to be beamed aboard the refurbished *Enterprise* in the comfort of their own living rooms.

One trekker who will not be beamed on or off the *Enterprise* in any way, shape or form is the original show's Mr. Spock, Leonard Nimoy. "We couldn't come to a meeting of the minds," Nimoy stated recently, referring to his negotiations with Paramount . . . negotiations that are still being carried out,

despite Nimoy's involvement in the forthcoming Phillip Kaufman re-make of the SF classic, *Invasion Of The Body Snatchers*. Nimoy will portray a psychologist who stumbles onto an early case of space-pod takeover. "Then I discover that a lot of similar cases are popping up," explained Nimoy in an interview. "What's happening is that the spores, who have landed here from another planet, are taking over the human bodies so that they get me, too. I become a spokesman for their concept, which is that it is not the worst thing in the world to have your body taken over by the spores. You get to keep your family, your house, your lifestyle. And many of the difficulties in living on this planet are removed. Life is more placid, more predictable. The catch is that individuality is removed in the process."

Also starring with Nimoy in *Invasion* are Donald Sutherland, Kevin McCarthy and Brooke Adams. □

THE NEXT "GIANT STEP"



It began not with a bang, nor a whimper, but with an advertisement. Rockwell International took a giant step into the Space Age Phase II—the reality of public interaction in outer space exploration and discovery—by placing ads in aerospace-related magazines inviting *anyone* to take advantage of their Space Transportation System. For anywhere from under \$10,000 to over \$20,000,000 the Space Division of the automotive, industrial, commercial, electronic, aircraft, and

space product corporation can put you and your experiment into outer space.

Unbelievable? Impossible? Ahead of its time? Not when one considers that the Space Shuttle and Spacelab systems are a mere two years away from regular use—two years before another supposedly science-fiction concept disappears in the face of fact. Already Rockwell has prepared, under the guidance of Dr. Geoffrey Canetti, an STS Utilization Service brochure detailing of what aid they can be to space-minded companies.

and organizations. Through their set-up, you can transport payloads to low Earth orbit and retrieve them; deliver payloads into high orbit for planetary missions; experiment in a habitable lab for up to thirty days and even check out and repair satellites. Not only will Rockwell see to your program requirements, costs and schedules, but they will design, develop, and manufacture the necessary hardware, calibrate your payload to three different safety standards, plan a smoothly running ground and flight operation, and integrate your flight within the STS for the optimum value.

And Rockwell has the proven record to do a high quality job. They have long been a leader in the space-business field, with experience going back to 1946 when they formed an Aerophysics Department to develop missiles for the Air Force. Then they led the way in peace-time space pursuits with the first Explorer Satellite being launched on their Rocketdyne-powered Redstone booster. By 1961 they were producing manned spacecraft, followed by becoming the prime contractor for the Apollo flights. Incredible as all this may still seem, as of August 25, 1977, 40 payloads had already been identified for 11 Space Shuttle flights in their first year of operation alone. Three firms have deposited money for payloads on eight flights in 1980.

FAST FOOD WILL GET FASTER IN THE FUTURE

The menu features pictures and smells—not words. Look—sniff—then press buttons to make your meal selections. Sit down and the food will arrive by conveyor belt at your table in 2 minutes.

Forget the french fries? Want another cup of coffee? Press more buttons and it will come to you by conveyor or pneumatic tube.

When you finish, merely standing up will activate a moving tablecloth to carry away the dirty dishes.

This is what a fast-food restaurant of the future will be like, according to Prof. Arthur Avery of Purdue University in Lafayette, Ind. By the mid-1980s people will eat every other meal outside their homes, he says, and fast-food eateries will have to get faster to keep up with the demand.

A professor of restaurant, hotel and institutional management, Avery also sees cooks moving out of the kitchen and into the factory. "High costs will be the reason," he comments. "It will be most economical for chefs, even top-quality chefs, to prepare food in fac-



© 2011 Edward Crisco

tories for shipment to the restaurants.”

Once in the restaurant, "preparation from start to finish should take only about 2 minutes," Avery remarks. Refrigerated pouches of food would be opened, cooked or heated by steam, infra-red or microwave radiation, and, in a matter of seconds, automatically put on a diner's plate.

Conveyor belts equipped with electronic readers to keep the orders straight already are used in Japan, Avery says. One restaurant there floats the food to the customers on belt-driven rafts.

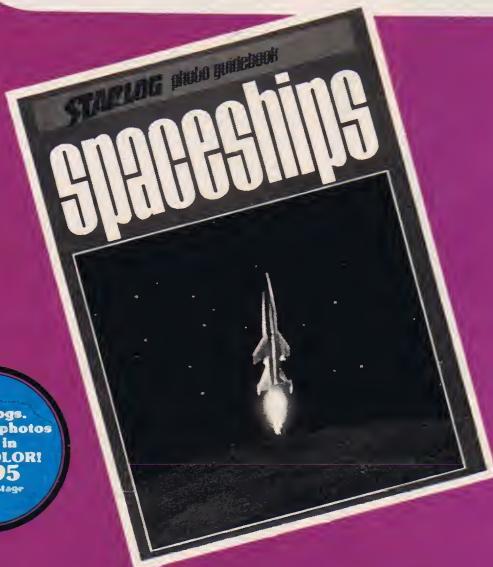
To add variety, a conveyor or pneumatic tube system might deliver the ingredients of a salad or entree to a table where the diners would make up their own meal and cook it in a wok or small microwave oven.

Avery predicts that, with rising supermarket prices, restaurant-goers will get their money's worth in the 1980s. It will be much cheaper for eateries to buy prepared foods from a factory than to hire people to cook them. There will be no cooks, and kitchen help will be minimal.

Even today, the professor points out, most restaurants with big menus have most of the items pre-prepared and frozen or refrigerated. "They simply cannot afford the expense of leftovers or the preparation of many separate items," he says.

Does this mean that leisure dining will go the way of the neighborhood butcher shop and fruit stand? No, Avery believes, "people always will want to eat leisurely and enjoy elegant surroundings and restaurants always will exist to satisfy that demand." □

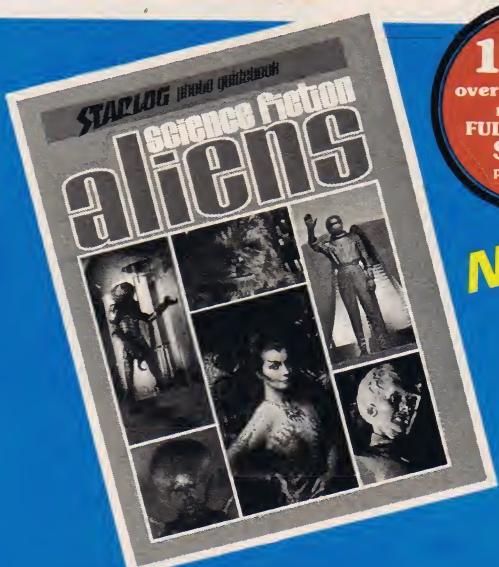
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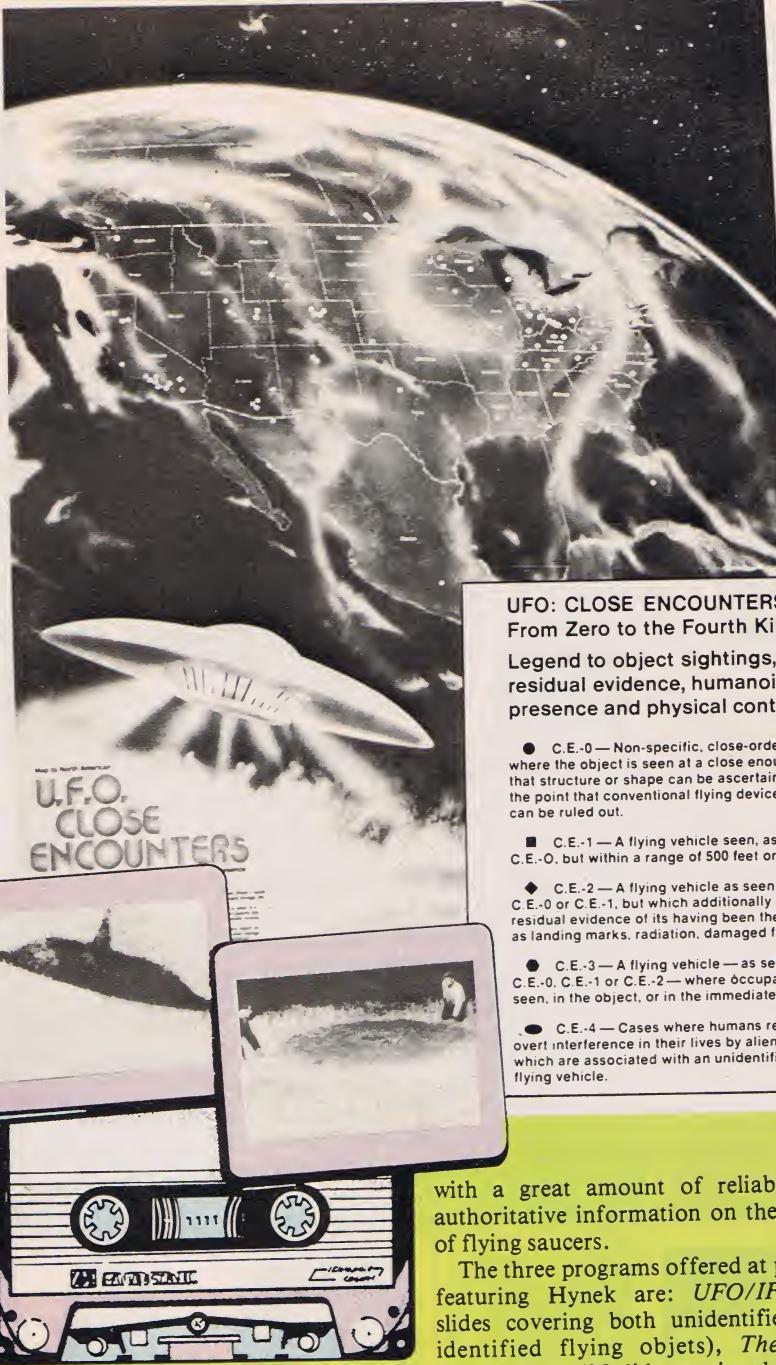
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UFOs IN YOUR HOME

The Edmund Scientific Company, one of the country's most prestigious stockpilers and dealers of scientific hardware, has recently acknowledged the importance of the global UFO flap via a multi-media flying saucer program. Shortly after the release of *Close Encounters Of The Third Kind*, Edmund announced the creation of a series of informative UFO 35mm slide/cassette sets. Dr. J. Allen Hynek, professor of Astronomy at Northwestern University, consultant for the film CE3K and director of the Center For UFO Studies at Evanston, Illinois, selected the slides for the three individual programs, aided by fellow workers at the Center. Each set includes an audio tape cassette narrated by Hynek, designed to supply the viewer

with a great amount of reliable and authoritative information on the world of flying saucers.

The three programs offered at present featuring Hynek are: *UFO/IFO* (25 slides covering both unidentified and identified flying objects), *The UFO Phenomenon* (25 slides tracing the many years of United States Air Force and scientific investigation of the mysterious UFO appearances) and *Close Encounters* (20 slides tracing actual encounters between Earthlings and ships from the beyond). A fourth program, prepared and narrated by Adrian Vance, shows full-frame and close-up photos of a dozen saucers sighted in the U.S., South America and France. An expert in photographic analysis, Vance states that these are "authentic UFOs" and not hoaxes.

If the audio cassette shows are not enough to satiate the UFO fancier, Edmund is also offering a long playing stereo record on the subject and a UFO library. Interested Ufologists are encouraged to write the company at 555 Edscorp Building, Barrington, N.J. 08007 for further information. **F**

The UFO Research Lab's visualization of the 131 "most credible" sightings was meticulous enough to be displayed in the lobby of the Boston Museum of Science.

UFO ENCOUNTERS

To most of the viewing public, *Close Encounters of the Third Kind* is an amazing science-fiction film filled with wonder and magic. But to hundreds of thousands of Americans CE3K means a lot more. For the many who have actually seen unidentified flying objects Steven Spielberg's massive movie is a public vindication of the first kind, a cinematic sympathy card for the trouble, the frustration and mis-understanding most witnesses have received at the hands of the authorities and even their own friends.

UFO sightings are real and numerous all over the world and long before Spielberg hired Dr. J. Allen Hynek as his technical advisor, people were trying to objectively investigate the phenomenon. Most notably, L.J. and Coral Lorenzen, two French scientists, who created the *Aerial Phenomena Research Organization* in 1952.

Now, twenty-five years later John Bryson, the President of the *U.S. UFO Research Lab, Inc.*, has used their files and those of the *Center for UFO Studies* to produce a map and booklet detailing the 131 most credible American UFO sightings, entitled *UFO Close Encounters: From Zero to the Fourth Kind*.

Mr. Bryson is quick to explain, however, that his organization and product is not the hastily produced outcome of an attempt to cash in on the movie landmark, rather, as he puts it, "it is really the other way around."

"The base of the producer's material came from the files of organizations such as APRO (but) true to the Hollywood method these groups were used to assist in the story development, but somehow were left out of the profit margin."

John doesn't intend this to happen with his work. The Lab has an arrangement whereby APRO gets twenty percent of his net and, since the Lorenzen's organization is non-profit, the money is basically in trust for further research.

John's involvement stemmed from his own experience with a UFO (which could be generally described as of a *Forbidden Planet* design) at the age of nine. He remembers, "I came cruising out of my bedroom to get a banana and a glass of milk at 3:00 one morning and on the way back I looked out the front window and I saw this craft cruising across the hillsides. I went and got my little brother and he came in and we watched it together. We knew better than to say anything to anyone about it."

When the elder Bryson finally decided to "clear the air" he attacked the project with a skepticism and professionalism ingrained by his father, an ex-*Time* magazine editor.

"When I came up with the concept about five years ago I did my research from books that were already published (but) I didn't feel secure that what I was writing was really accurate. You know how the writer will tend to put their own imaginations in with what's there. (Then) I was granted permission to utilize APRO material and I reviewed probably 24,000 cases from 1952 to 1975. From that we edited it down to 500.

"We had the opportunity to use some of CUFOS' material (created by Dr. Hynek in 1974) and we felt that would give the reader a broader base to relate to since APRO is on the west coast and CUFOS is on the east coast. We finally edited it down to 131 of what we considered the best cases."

John hopes to use the profits from his work to take the extensive APRO files and feed them into computers, having symbols for the many specific areas involved in UFO sightings—color of craft, area of sighting, geographic location, time of sighting, how many witnesses, psychological reactions, and many others.

"We hope to tie it in with other computer systems," said Bryson. "Like the National Weather Service in order to analyze weather patterns. When they have a 'flap,' when large numbers of crafts are seen by hundreds of people over a three or four day period, this is always accompanied by a high pressure weather zone. What does that tell us? Maybe it doesn't mean anything but perhaps it does."

This last piece of information may sound familiar to *CE3K* audiences since the Doug Trumbull created UFOs used clouds as camouflage, but that isn't all the film and Bryson's investigation has in common.

"Jim Lorenzen, in particular, who's the international director of APRO . . . I have a feeling . . ." John mused. "I've just seen stills but Trauffaut (Lacombe in *CE3K*) looks very much like him."

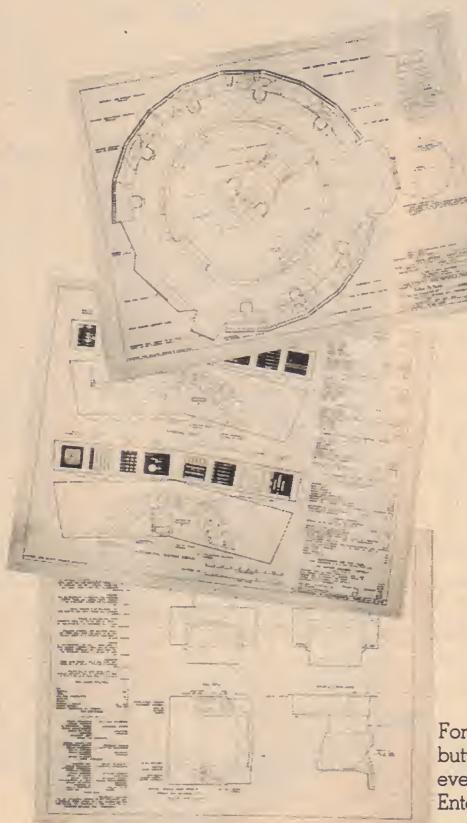
The film's basic honesty to the reality of the UFO phenomenon and its subsequent success has not been lost on Bryson either.

"I think it's a subject whose time has come. Right now we're in negotiation with a major distributor for the retail end of it, for world-wide distribution. If you want to know what I'd like to see happen and maybe I'm being unrealistic and a dreamer, but maybe enough reaction will take place throughout the world that the United Nations will send out a cassette saying they're ready to negotiate."

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ELLISON SUPPORTS ERA AT 1978 WORLDCON



Pro ERA author, Harlan Ellison feels that science-fiction fans should join the cause. "It's not enough to talk the talk . . . we must walk the walk," he stated in a recent note.

When author Harlan Ellison appears at Iguanacon, the 36th annual World Science Fiction Convention as Guest of Honor this August, he'll be doing a lot more than simply exploring the worlds of science fiction - he'll be politicking as well. The '78 WorldCon is being held in Phoenix, Arizona; a state vehemently opposed to the Equal Rights Amendment. Ellison, much in favor of the ERA movement, was faced with a dilemma. Should he boycott the Arizona gathering because of anti-ERA groups, the same way he boycotted the Miami WorldCon because of Anita Bryant's influences? Or should he attend . . . on his own terms. Harlan opted for the latter, stating "It is not enough to talk the talk; in this life we must walk the walk, as well. Otherwise we are lip-service hypocrites."

In a letter circulated throughout the science-fiction community and dated

December 5, 1977, Ellison urged all attendees to support his pro-ERA activities. "I will come to the Convention as Guest of Honor, but I will do it in the spirit of making the Convention a platform for heightening the awareness of fans and Arizona as a whole to the situation," he wrote. Harlan's plans for the WorldCon include promoting the ERA situation via discussions and publicity and promotional hand-out material.

He invited other concerned SF fans to participate in his pro-ERA stance by withholding money from the state as much as possible. He suggested fans bring their own food (thus eliminating traffic at local stores), stay with a local fan or on nearby campuses (instead of in hotels) and spend money only in out-of-state dealer and huckster rooms.

In summation, Harlan said: "For decades SF has trumpeted about Brave New Worlds and what Slanlike futur-

istic thinkers we are, how humanistic SF is, how socially conscious we are, how SF stories can deal with delicate social issues that mimetic fiction is afraid to talk about. And yet, on the whole, SF fans and pros live in Never-Never Land when it comes to taking part in the pragmatic world around them; they would rather escape into a realm of creative anachronisms than go to the battlements to fight the real wars; to be precise, SF fans and professionals tend to be terribly provincial about the pressing issues of our times, to turn their heads and say it is none of their affair.

"Dealing with far-flung galactic civilizations is great fun, but we're supposed to be *concerned* people. And so . . . at what point do we put our bodies on the line for things SF says are important: freedom, equality, living at one with the planet, free speech, intellectual awareness, courage, the best possible condition of life for people.

" . . . Can we permit the gap between what we *say* we are, and what we *really* are, to exist? Or is this, perhaps, a moment when we can make a brave statement with our fiction, our literary love, our bodies, and our annual World gathering?"

Ellison ended his letter with the tantalizing statement, "Arizona, the WorldCon and I offer you this opportunity." While Ellison's heartfelt plea was totally compelling, the Hugo Award-winner was not about to allow the world to think that he was devoting his time exclusively to the political battlefield. Later on that month, he appeared in the Victor Hugo Bookshop in Boston, the home of *Galileo* magazine, where he composed 12,000 words of fiction in three days while sitting in the store's front window.

The author has never been noted for a low profile. F

NEW SATELLITE CONCEPT

NASA's Marshall Space Flight center recently issued a request for proposals on how to build a *tethered satellite system*. "Trolling" a satellite attached to an orbiting Space Shuttle by a cable up to 85 miles long through the Earth's upper atmosphere to gain scientific data is one of several potential applications for the system. The tethered satellite idea was conceived to provide long-duration measurements in the atmospheric region between 50 and 75 miles between the orbiting Shuttle and the Earth. The atmospheric density of this region is not sufficient to support the flight of aircraft or balloons, yet it is too dense for free-flying satellites to remain in orbit for appreciable lengths of time. Previous exploration attempts have been limited to a few low-level satellites. A typical orbital altitude for the Shuttle in this concept would be about 160 miles. Pull exerted by Earth's gravity, plus constant tension kept on the tether cable, would keep the captive satellite at the end of the "string" oriented toward Earth. The tether would be automatically reeled off a spool and the satellite would be maintained in its preprogrammed position by a computer. The computer would also control the tether, measuring the line tensions. Other possible applications of this system are: cargo transfer between two space vehicles, retrieval of satellites or debris without having to maneuver the Shuttle and transfer of large amounts of energy to a remote experiment.

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THE FATHER OF THE LONG PLAYING RECORD DR. PETER GOLDMARK (1906-1977)

Long Playing Microgroove Disc Demonstrated By Columbia Records," read the headline of the CBS press release dated Monday, June 21, 1948. "Revolutionary New Home Phonograph Record Plays 45 Minutes," it continued. "Entire Symphony On One 12 Inch Disc."

The first long playing album, as well as countless other scientific wonders, were the work of electronics' wizard Peter Carl Goldmark. When Dr. Goldmark was killed in an automobile accident in New York on December 7, 1977, the world was robbed of a visionary thinker, a man who was not at all opposed to letting his imagination take control.

Goldmark was born in Budapest, Hungary on December 2, 1906. During his early school years, he became interested in physics, mathematics and optics. He also showed a fascination for the infant fields of radio and television. After his family moved to Vienna, Dr. Goldmark began working on his inventions in earnest, though barely out of his teens.

His first patent was for an automobile horn that could be activated by a touch on the driver's knee. His desire to expand the realm of visually-related electronics led him to assemble, in 1926, a British-designed kit for a primitive TV set that would receive late night experimental signals, broadcast from the newly created British Broadcasting System in London.

On June 21, 1948, Dr. Peter Goldmark posed with his newest invention, the long playing record. In his hands is the LP equivalent of the stack of 78 rpm records at his side. By 1977, Dr. Goldmark had patented over 170 inventions in the communications field.

After departing the University of Vienna with both baccalaureate and doctoral degrees in physics, he moved to England in 1931 where he began working with modern television systems, a "hobby" he would relish for the rest of his life.

"My work in color television," he recalled in his later years, "resulted, I think, in bringing color to the public a decade faster than it might otherwise have come, though not exactly in the form I intended."

Goldmark journeyed to the United States in 1933, eventually joining the Columbia Broadcasting System as chief television engineer in 1936. While at CBS, he experimented both in television and phonograph equipment. It was at CBS that he pioneered the long playing record.

Dr. Goldmark wrote that he began to toy with the idea of a long player after listening to a 78 rpm version of Brahms' Piano Concerto No. 2, which was virtually truncated because of the need to continually change records. Goldmark wished aloud for a record that would play for a longer period of time. That was in 1945. By 1948, his LP was a reality.

Besides the long-player, Goldmark developed sapphire phonograph styluses to replace the rough steel needles com-

monly used on record players in the 1940s and 50s; introduced a vinyl plastic record design in lieu of the fragile shellac models; developed a lightweight phonograph tone arm to insure a longer record life; constructed a uniformly smooth rotating turntable; worked on a rotating disk method for color television that was nearly adopted by the FCC and pioneered the video cassette field which eventually led to the viewing of recorded film cassettes on television. Even the color transmissions beamed to Earth from the Moon missions used a color system extrapolated from Dr. Goldmark's original concept.

All of Goldmark's concepts led to complete innovations in the communications field, a fact he somewhat modestly recalled in 1973. "As I look back," he wrote, "I think my contributions were, somewhat ironically, not so much the invention itself or an innovation—a word I prefer because it means putting an invention to work, but in its gadfly impact on industry."

Dr. Goldmark retired from CBS in 1971. Although the President of CBS Laboratories, he had reached the age of 65 and was required to leave the firm. But in Goldmark's eyes his work was far from finished. There were new challenges, new solutions and new inventions ahead. Taking his notes and his dreams with him, Goldmark formed his own company, the Goldmark Communications Corporations. Under the aegis of Warner Communications Inc., Goldmark's new laboratories explored the possibilities of establishing television and data communications between widely scattered special interest groups, such as businessmen and school children.

Two weeks before his death, Dr. Goldmark was honored by receiving the National Medal of Science from President Carter at a White House ceremony. Dr. Goldmark was lauded for his work in the communications field, education, entertainment and culture.

Goldmark once summed up his life-long preoccupation for turning dreams into reality by saying: "So much basic technology goes begging for want of someone to come along and take the step of innovation. An inventive idea without development is quite useless."

Dr. Peter Carl Goldmark died at the age of 71 while en route to a meeting concerning his communications system. To the end, he was both a dreamer and inventor. He revolutionized the recording industry because of his constant search for innovation. His passing leaves a great void in technological research, in the hearts of the people he worked with and in the lives of those of us he touched with his work and his passion for life.

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Bergman, Alan Carter, Tony, Maya, etc. There is also a complete Timeline and Episode Guide section with photos, credits, and plot synopses for all 48 TV adventures. Compiled under the supervision of the STARLOG editors, the NOTEBOOK is written by David Hirsch and drawn by Geoffrey Mandel, the technical team who developed the Eagle Blueprints for STARLOG No. 7. This limited edition publication (each one will be registered to the owner) is the one and only authorized version approved by Gerry Anderson Productions and ITC Entertainment.

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TODAY**



Bette Davis as Letha Wedge prepares to aid Professor Victor Gannon (Chris Lee) in his attempt at telekinetic take-over.

Pyle). Tia and Tony are being allowed to stray from the extraplanetary community of Witch Mountain for a few weeks in order to get a first hand look at what life is like in a major Terran city: Los Angeles. Uncle Bene leaves the pair with an admonition to limit their use of telekinesis.

At that moment in nearby Los Angeles, demented doctor Victor Gannon (Christopher Lee) and his money-hungry associate Letha Wedge (Bette Davis) are testing the limits of their home-grown methods of mind control on a dull-witted assistant, Sickle (Anthony James). At Gannon's command, the hapless half-wit climbs to the top of a building and attempts to plunge to his death. The cab containing the psychics from space passes below. Tony, sensing the danger, runs from the cab and employs mentally-induced *degravitation* to bring plummeting Sickle slowly to the ground. Gannon, recognizing a natural power far superior to his scientifically created one, resorts to good old American ingenuity and kidnaps the boy, imprisoning him in the subterranean lab of Letha's gloomy mansion.

Tia, understandably annoyed, enlists the aid of the "Earthquake Gang:" Muscles, Crusher, Rock and Dazzler (Brad Savage, Poindexter, Jeffrey Jacquet and Christian Juttner) in her search for her brother. She follows the weak psychic pulses that Tony occasionally emits from his prison.

Heavily sedated, the plucky alien boy staves off the efforts of Gannon and Letha as they attempt to harness his mental powers. Fitted with the professor's brain-controlling device, the lad is forced into a state of cerebral servility by Gannon. The professor's ultimate goal for his telekinetic research? World domination. Letha, however, has more practical thoughts on her mind. She devises a scheme wherein Tony's talents will be used to steal a fortune in gold bars from a museum display. Her efforts backfire in mid-robery and Tia and her troupe hone in on Tony's telepathic presence. During a wild chase at the museum, Letha manages to snatch Tony away from the rescue party.

But the resourceful sister is able to follow her brother's psychic call for help. Arriving at the mansion, she is captured by Gannon. His plans for world domination have now crystallized into an easy scenario. He'll take Tony, Letha and Sickle to a nearby nuclear processing plant. Using Tony's mental gymnastics, he will enter the grounds and seize control of the complex. Then, unless his demand for \$5 million in cash is promptly met, he will destroy the plant, causing worldwide nuclear fallout. "They'll pay anything to prevent that," he gloats. "This is the first

Photo: © 1977 Walt Disney Productions

TELEKINETIC TEENS RETURN

This Easter, Walt Disney Studios' two telepathic teens from outer space will again invade theaters coast-to-coast in *Return From Witch Mountain*. A sequel to the 1975 hit, *Escape To Witch Mountain*, the film follows the further exploits of extraterrestrial youths, Tia (Kim Richards) and

her brother Tony Malone (Ike Eisenmann) as they match their mind-controlling abilities against the forces of some of Earth's less desirable denizens.

The duo's misadventures begin when they are dropped off within the confines of the Pasadena Rose Bowl by a flying saucer piloted by Uncle Bene (Denver

MAY THE IOUs BE WITH YOU

When *Star Wars* debuted last summer, everyone expected that the big rage of Christmas 1977 would be a line of *Star Wars* toys. Well, the *Star Wars* line from Kenner certainly was a big seller last Christmas. Then again, the line really didn't sell at all. The entire series of SW "action models," from Ben Kenobi to Chewbacca, did not make it off the Kenner assembly lines in time for Christmas. What the toy company came up with in lieu of the dolls was a unique line of deluxe *Star Wars* IOUs. Listing for \$16.00, the almost-Christmas gift was entitled the "Early Bird Certificate Package," a large envelope which contained a cardboard picture of the twelve missing *Star Wars* figurines.

The packet also included a mail-in gift certificate guaranteeing the delivery of "four authentically detailed *Star Wars* action figures" sometime between February 1 and June 1, 1978. Tossed in for extra clout were a few SW stickers and a *Star Wars* Club membership card. Initially it was reported that the dolls missed the Christmas rush because Kenner was too late in securing the all important license to manufacture the toys. According to Kenner, however, that was

not the case. They secured the license in May of last year but got caught up in a corporate nightmare.

According to Kenner sources, problems began when, during each stage of the toy's development, they were required to send every sketch and every prototype out to 20th-Century-Fox in Los Angeles for approval. After weeks of slowdowns, the toy manufacturers finally were able to get their tool and dye people to begin modeling the figures from wood to metal before eventually getting to the plastic stage. By this time, however, Christmas was just around the corner.

The net result? A lot of empty *Star Wars* boxes found under Christmas trees. And, although SW fans were perfectly willing to cling to their IOU for six months, a lot of parents weren't willing to plunk down cold cash for an imaginary present. Worse yet, a lot of toy stores simply wouldn't stock the invisible toy. "What kid wants to celebrate Christmas in June?" wondered one Manhattan store owner.

No matter when Kenner actually ships the toys, optimists note, they are sure to finish the line before the premiere of *Star Wars II*—two years from now. ■



step in making myself the most powerful man in the world."

While Gannon is attempting to make his dream into reality, Tia escapes her bonds via mental control. She empowers a broken-down mini-bus to take her and her gang to the plant in time to stop its destruction. Tony, unfortunately is still a psychic serf . . . lashed to the maniacal mind of Gannon. The prof. orders the boy to fight his sister using telekinesis and the brother and sister team restage the gunfight at OK Corral; shooting from the cranium, as it were.

With objects hurling through the air randomly, the pair finally exhaust themselves, with Tia overwhelming her weakened brother. Once Tia is in control, Gannon's plans fall flat. The authorities take over and, bidding the Earthquake Gang farewell, the alien children make their way back to the Rose Bowl where they are met by a friendly uncle and saucer.

Directed by John Hough, who handled similar psychic chores in *The Legend of Hell House*, *Return From Witch Mountain* is a power-of-mind-control film played strictly for laughs. Saucers soar majestically, people float magically, objects slash through the air and ordinary animals become mentally-controlled servants as the two space children encounter some of Earth's more common prejudices. To be different is to be mistrusted and misunderstood; great natural ability will only arouse jealousy, unscrupulous plotting and power-mad commercialization; the world is under constant threat of nuclear contamination.

Laugh it up. This is a kid's movie. □

photo: ©1977 Walt Disney Productions



Upper left: Tony Malone shows his sister Tia (Kim Richards) and Uncle Bene (Denver Pyle) the best way to circumvent a padlocked gate. Above: members of The Earthquake Gang are justifiably stunned by this amazing telekinetic treat.

KEEP ON TREKKIN'

Joining the over fifty other *Star Trek* books on the best seller lists is Bantam Books' *Star Trek Fotonovels*. But the volumes, produced by Mandala Productions, Inc., in California, have an important difference. Whereas the others are adaptations or derivations, these are actual episodes. That is, individual segments of the SF show chronicled with over 300 full-color photographs, done up comic book style with dialogue from the original screenplays. Herbert Stewart, Lazlo Papas, and Alain Vilard, the Chairman, President, and Editor of Mandala, respectively, adapted a concept that was both unique and pre-tested. Black-and-white magazine variations of the Fotonovel are very popular throughout the world, but usually deal with original stories—romances, mysteries and the like. Man-

dala went two better, presenting the already popular TV show and printing the pictures in almost-living color. Their choice of episodes proved wise as well. Fotonovel One was "The City on the Edge of Forever," by Harlan Ellison, winner of the Writer's Guild Award, the World SF Convention Achievement Award, and the George Melies Fantasy Award. Number Two was "Where No Man Has Gone Before," by Samuel A. Peeples, originally scheduled as the *Star Trek* pilot. Next was one of the *Enterprise's* most popular voyages, "The Trouble With Tribbles," by David Gerrold. Coming up in January, February, and March will be "A Taste of Armageddon," by Gene L. Coon, "Metamorphosis," again by Mr. Coon, and "All Our Yesterdays," by Jean Lisette Aroeste. □



Art: Mark Spangler

SF GETS HOLLYWOOD TREATMENT

With big-budgeted films such as *Close Encounters Of The Third Kind* and *Star Wars* earning equally titanic ticket returns, the powers-that-be in Hollywood are no longer hesitant to pour dollars into SF entertainment. At present, Walt Disney Studios is in the vanguard of the celluloid SF movement, planning three genre films including the epic *Space Probe*. Budgeted at somewhere between \$10 and \$14 million dollars, *Probe* will be the most expensive movie in the Disney studio's history.

Ron Miller, executive vice-president in charge of production at the Disney headquarters, said recently that the motion picture has been planned for some four years. The Disney studios, no strangers to SF (*Twenty Thousand Leagues Under The Sea*, *Moon Pilot*, *Escape To Witch Mountain*), are pleased with the success of *Star Wars*. Thanks to the new SF boom, they feel they can mold *Space Probe* into a more "bizarre" film than originally intended.

FARMING THE MOON

Lunar agriculture is not as strange or far-fetched a notion as it initially sounds. The surface of the Moon has been pounded into dust by constant meteorite bombardment during the four billion years of its existence. This fine-grained lunar soil is mineral rich. Samples brought back by Apollo astronauts have already proven to be an excellent growth medium for most Earthly plants—with the addition of bacteria-rich water.

In Arthur C. Clarke's autobiography, *The View From Serendip*, he suggests that farming the lunar surface is entirely feasible. Using established methods for the genetic manipulation of plants (which scientists have been doing ever since Gregor Mendel's groundbreaking work with pea plants in the 18th century), cactus-like plants could be cultivated for growth on the lunar surface. They would have to be "cactus-like" for water retention. Evaporation could also be retarded by covering the "fields" with a thin, plastic umbrella.

Going a step further, Clarke speculates that if lunar colonies become a reality, "there will be a move to give the Moon a breathable atmosphere, probably by using biological systems (i.e., plantlife) to unlock the immense amounts of oxygen—about 50% by weight—bound up in the lunar crust."



Photo: Warner Bros.

A few years ago, skeptics world-wide accused the Russians of faking their first space walk. In *Capricorn One*, NASA painstakingly fabricates a mission to Mars.

JUST LOOK WHAT YOU'VE MISSED!

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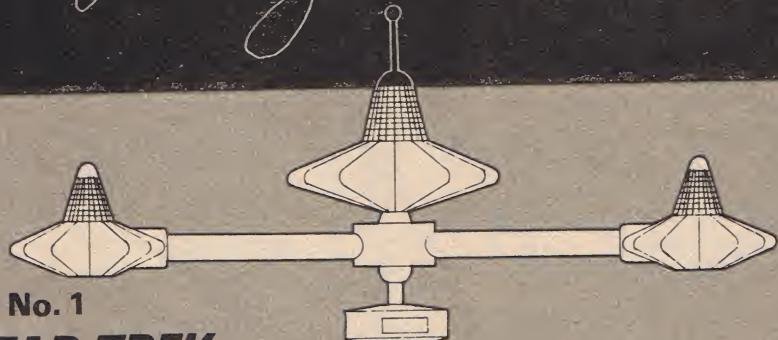
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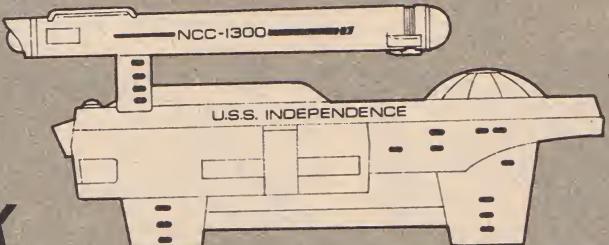
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Production has already begun. The miniatures are already under construction and special effects are due to begin filming in either April or May. Principal photography will take place during this summer with a *Space Probe* release date targeted for the summer of '79.

Also in the planning stages are the \$4 million dollar *Astronaut In King Arthur's Court* and the \$9 million live action, animated *Hero From Otherwhere*. Awaiting release in '78 are *The Cat From Outer Space* and *Return To Witch Mountain*.

On tap from Warner Brothers is a startling science fact-fiction film entitled *Capricorn One*. Presented by ITC's Sir Lew Grade and produced by Paul Lazarus III, *Capricorn One* takes a terrifying look at a "what if" space shot scenario. Specifically, what if NASA decided to "fake" the first manned landing on Mars for the benefit of a gung-ho world? James Brolin, Sam Waterston and O.J. Simpson star as the three astronauts aboard the *Capricorn One* spacecraft. They are forced to simulate elaborate television transmissions of their flight and eventual landing on Mars from a giant sound stage tucked away in desert terrain. Hal Holbrook, as the head of NASA, will do anything to insure the success of this elaborate ruse.

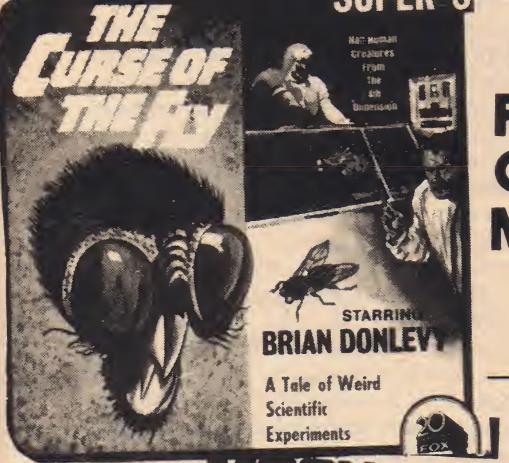
Accidentally stumbling across the deception are investigative reporters Elliott Gould and Karen Black and local daredevil pilot Telly Savalas. In spite of the potential of "bad press" for the space program, NASA loaned more than a half million dollars worth of spaware to the venture. Warners has not yet scheduled *Capricorn One* for release. When this Peter Hyams written-directed venture does debut, however, a lot of ticket holders will be left slack-jawed at the thought of government subterfuge on such a grand scale.

Currently in production are Irwin Allen's *The Swarm* (killer bees), Sandy Howard's *Meteor* (a meteor heads for an earthly town populated by Sean Connery, Natalie Wood, Henry Fonda, Martin Landau, Karl Malden and other startled stars), John Dark's *7 Cities To Atlantis* (Doug McClure and Cyd Charisse watch the waves rise) and *Starcrash* (Caroline Munro, Marjoe Gortner and Christopher Plummer in space).

Currently being planned for future filming are Larry Niven and Jerry Pournelle's novel, *Lucifer's Hammer* (purchased by Sherman Grinberg Production, the movie will detail the events following the collision between Earth and the comet, *Lucifer's Hammer*), Isaac Asimov's classic *I Robot* (the three laws of robotics are tentatively to be brought to the screen via a script by Harlan Ellison) and Arthur C. Clarke's famous SF'er, *Rendezvous With Rama* (proposed as a full-length animated feature film). F

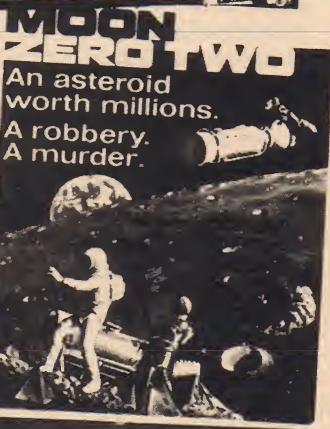
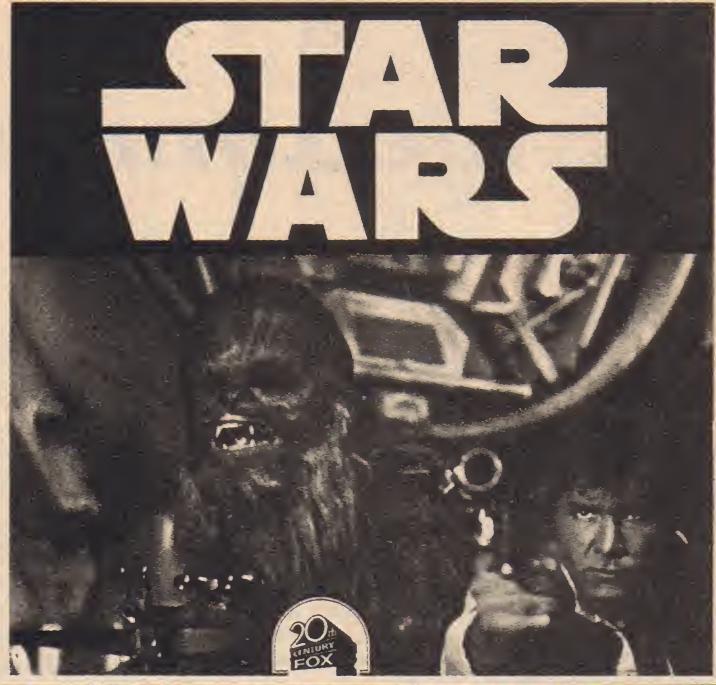
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3. **THE CURSE OF THE FLY:** Brian Donlevy stars as the latest scientist to attempt the transfer of matter, thus unleashing a group of half-human, half-animal creatures from the 4th Dimension. Super 8 b&w.
4. **THE WAR OF THE WORLDS:** H.G. Wells' legendary tale of Martian invasion is given a spectacular treatment by producer George Pal in this Oscar winning film. The Martians and their death machines invade California and not even the A bomb can stop them. Super 8 b&w.
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Edited By ED NAHA

The 1977-1978 television season will be remembered as one of the most unusual video traumas ever to shake the major networks. Weekly scheduling has virtually disappeared during a manic ratings war and new series are unveiled and dropped without fanfare. At present, ABC, CBS and NBC are hard-pressed to come up with shows boasting "instant" appeal for the rapidly approaching Second Season. With the success of theatrical smashes such as *Star Wars* and *Close Encounters Of The Third Kind*, the television empire is very much aware of science fiction. The trouble is, no one is quite sure what to do with it. Networks are torn between going for the standard, action-oriented weekly series and more cerebral, occasional fare.

While regular adventure shows such as *The Bionic Woman*, *The Six Million Dollar Man* and *Wonder Woman* continued to hold their own in the ratings, newer shows such as *The Man From Atlantis* and *Logan's Run* were doomed by poor viewer response from the start. As a result, all three networks are approaching science fiction positively, but hesitantly . . . often opting for mini-series and special telefilms instead of weekly shows. Here, at a glance, is science fiction's immediate video future.

CAPTAIN NEMO: CBS plans three one-hour installments of this Irwin Allen produced series. The show focuses on Jules Verne's epic present day surroundings. Also featured, of course, will be the supersub *Nautilus*.

FANTASY ISLAND: ABC scored so heavily, ratings-wise, with both the 1976-77 and 77-78 seasons' telefilms *Fantasy Island* and *Return To Fantasy*

Jose Ferrer as Captain Nemo points to a place of interest to the demented Professor Cunningham (Burgess Meredith) in the forthcoming *The Return of Captain Nemo*. The three part mini-series was produced by Irwin Allen.

Island, that the network has now planned it as a weekly series. A Spelling-Goldberg production, produced by Michael Fisher, the show stars Ricardo Montalban and Herve Villechaize. Montalban plays the mysterious owner of an equally mysterious island where the very rich and the very bored journey to have all their dreams come true . . . literally. More often than not, the results are nightmarish.

FLASH GORDON: Filmation is currently adapting Alex Raymond's classic comic strip character for a two hour, animated special to be telecast in the fall of 1978. Produced by Norm Prescott and Lou Scheimer, the cartoon will be drawn in a style fashioned after Raymond's classic look. Flash, Dale, Zar-kov and friends will battle Emperor Ming in the days of World War II after discovering that the irrepressible madman has joined forces with Earth's very own megalomaniac, Adolf Hitler. The special will be written by Sam Peeples, who penned the famous "Where No Man Has Gone Before" pilot episode of *Star Trek*.

GALACTICA: If ABC gives the go ahead, Universal's *Galactica* could be the biggest SF series ever to grace the tube. Produced by Universal TV and helmed by Glen Larson (executive producer) and *The Outer Limits'* Leslie Stevens (supervising producer), *Galactica* will feature special effects by co-producer John Dykstra, of *Star Wars* fame. Says Dykstra of the space opera: "There's a great deal of similarity between the material we're doing for *Galactica* and the special effects we did for *Star Wars*. Hopefully, our story lines will be a little looser than *Star Trek's* or *Space: 1999*'s. If we can incorporate SFX and character development, we'll have a perfect show. The

first scripts I've read look good. We have aliens that are ongoing characters. We've got bad guys and good guys and they fly fighters and have a home base." Although there has been no official word as yet from ABC on *Galactica*'s fate, work on the show's optical effects has been going on since October. The show's live-action elements are due to be filmed momentarily with the series being targeted for the 1978-79 schedule.

IN THE DAYS OF THE COMET: George Pal has been contracted by Paramount to do this mini-series based on the H.G. Wells tale. Says Pal: "We start with the crack of the San Andreas Fault. Then, the tidal waves come and wipe out Los Angeles and we show all of California slipping into the Pacific. We go on from there." When the show goes on is, at this point, anyone's guess—as is what network will ultimately buy it. *Comet* looks good for the 1978-1979 season.

THE INCREDIBLE HULK: CBS is currently preparing the Hulk for a regular series. The network was quite pleased with the ratings garnered from the two '77 Hulk tele-films produced by Ken Johnson. Also in the works at CBS are film versions of Marvel heroes Dr. Strange and The Human Torch.

THE MARTIAN CHRONICLES: Following the success of the Los Angeles stage production of this Ray Bradbury classic, CBS is attempting to launch a mini-series inspired by both the book and the play.

THE NEXT STEP BEYOND: This one is being produced as a syndicated series. It will be an extension of the old supernatural/psychic phenomena-laden show *One Step Beyond*. Set for spring release on local stations, *The Next Step* is hosted and directed by *One Step's* original guiding light John Newland, with Collier Young acting as executive producer.

PROJECT: UFO: NBC has given the go ahead to Jack (*Dragnet*) Webb to begin production on the *Man From Atlantis'* replacement series, *Project: UFO*. Based on actual reports culled from the Air Force's *Project Blue Book*, the series will star William Jordan as Major Jake Gattin and Caskey Swaim as Sgt. Harry Fitz; Ufologists extraordinaire. The show is produced by William Goldman (a retired Air Force Colonel who actually participated in the Blue Book team) and Don Wydner. Shot both on location and at the



Photo: CBS

Goldwyn studios in California, the show will have "beautiful special effects" (according to an NBC official). The saucers that make their way to the TV screen will be constructed by Brick Price, editor of International Modeler Magazine.

TV MOVIES: There are several telefilms in the offing. ABC leads the way with three way-out titles.

The Sweetheart of Sigma Chi stars Kay Lenz as a lonely young coed who is somewhat of a social misfit. After discovering that she possesses unheard-of psychic powers, she spends most of her waking hours dealing out death and destruction to all those that "done her wrong." Directed by Jay Benson, the film is a Stonehenge Production.

Voyage Into Evil recounts the tale of a group of archeologists who disturb the tomb of an Egyptian pharaoh, hauling his mummy aboard their luxury yacht. Needless to say, the voyage home is a rough one.

Night Cries stars Susan St. James, Michael Parks and William Conrad in a tale of psychic terror. A woman whose child was stillborn finds that, during her dreams, she communicates with her "lost" baby. The infant tells her that it's alive, but not too well; its "life" is being threatened by an untold danger.

CBS is seeking safer fare, optioning Aristotle Phillips' life story, *Sitting On A Mushroom* for possible spring presentation. Aristotle is the Princeton senior who made headlines a year or so ago by designing a working atomic bomb. The film will detail his life as a student before and after he built the weapon—detailing how ridiculously easy it was for him to talk his way into government installations where he copied the plans for the Los Alamos Project. Phillips will play himself.

Spiderman: Buoyed by the ratings of last fall's TV flick, CBS has ordered five *Spiderman* specials for the spring.

The Man With The Power, an SF pilot from last year that didn't sell, will be back again this year starring David Ackroyd. The new *Power* script was written by Gerald Sanford. Alan Balter will be producing this NBC offering at Universal. Ackroyd will also star in NBC's spooky mini-series, *Harvest Home*, based on the bizarre best seller penned by Tom Tryon.

QUARK: NBC still hasn't scheduled its SF comedy *Quark*, but does have nearly a half-season's worth of episodes in the can. Created by Buck Henry (*Get Smart!*), the show lampoons SF in general and movie classics episode by episode. Sample titles of shows to come are "All The Emperor's Quasi-Norms" and "May The Source Be With You." The series follows the exploits of Adam Quark (Richard Benjamin) who patrols the Milky Way in his United Galaxy Sanitation Patrol ship, collecting gigan-

tic space boggies. Along for the ride are crew members Betty One and Betty Two (one's a clone), Andy (a nearly uncontrollable android), Ficus (a superlogical alien who is more vegetable than human) and amorphous mascot, Ergo.

WAR OF THE WORLDS: CBS is actively considering either a mini-series or a weekly version of this H.G. Wells classic for either the spring or the fall TV season. Originally envisioned as a video venture years ago by George Pal (who produced the film of the same name), the project has been rejected a number of times in various forms. Three years ago, *War* was attempted as a TV special and, again, was turned down. At present, a twenty minute film presentation featuring Magicam effects and Mike (*Star Trek II*) Minor paintings is making the rounds at the behest of Paramount TV. **F**

Right: William Conrad doesn't seem too pleased with Susan St. James' nightmares in *Night Cries*. Below: First Mark Harris lost Atlantis, now he's lost his show.



Photo: NBC

science notebook

When the two landers of the Viking Mars mission completed their biological experiments last April, a feeling of disappointment pervaded the minds of Earthlings embarked on an eager search for life on Mars. The complex Viking laboratories, while returning strangely perplexing results, failed to yield proof positive for the existence of life—large or small, today or in the past.

No other project of unmanned space exploration had been awaited with such breath-holding suspense: In July and September 1976 "Viking I" and "Viking 2" had alighted on Mars. Both were equipped with identical biochemical instrumentation. Safely asquat on opposite sides of the planet (in Chryse Planitia at 23 degrees north latitude and Utopia Planitia at 48 degrees north latitude, respectively), they began their quest for life.

Paradoxically, their experiments had to be designed for a mission that would eventually *acquire* much of the information needed for their design *in the first place*. In the absence of such knowledge some prior assumptions had to be made about the nature of Martian metabolic activity. Thus, the laboratories were essentially limited to seeking life "as we

know it." Among other things, this assumes that organic life requires molecules based on the element carbon; that it requires water; that it derives energy by breaking these organic carbon-based molecules down through

"oxidation;" and that it creates or synthesizes other carbon compounds through "reduction," the opposite of oxidation.

In both Landers, mini-laboratories analyzed soil samples for life on three

Searching For Life On Mars



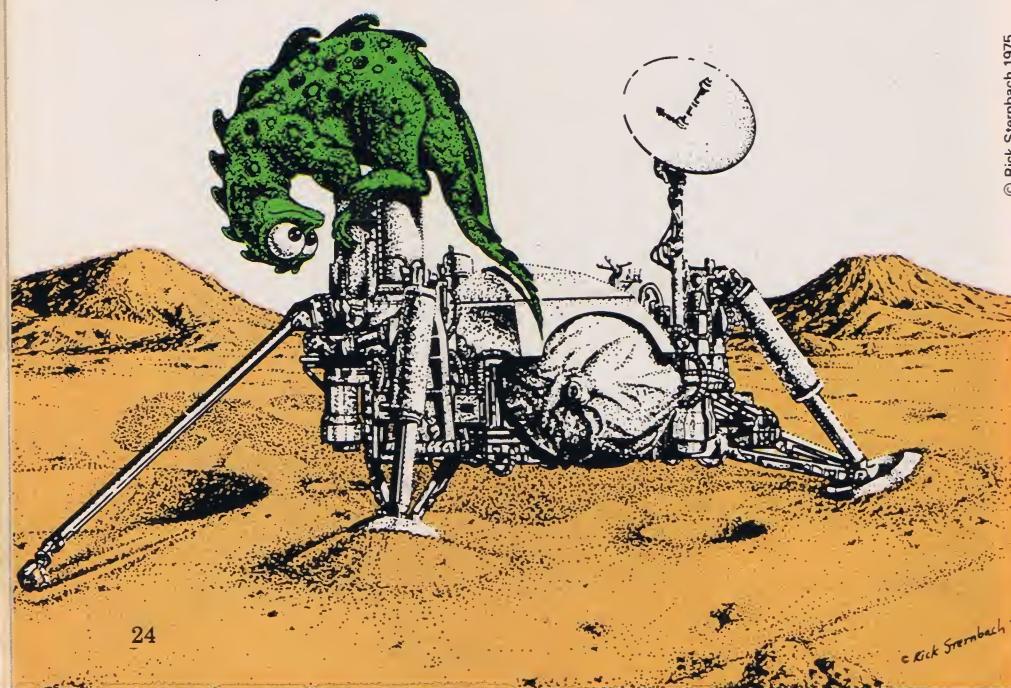
von Puttkamer

Jesco von Puttkamer is Program Manager of Space Industrialization and Integrated Long Range Planning Studies in the Advanced Program's Office at NASA. He holds a B.S. in General and Aerospace Engineering and an M.S. in Aerospace Engineering. He is a member of the American Institute of Aeronautics and Astronautics. He has also written a number of books on spaceflight and has received special NASA awards for his contributions to the development of the Saturn V launch vehicle, among many others. Jesco is the science advisor for Paramount's forthcoming Star Trek movie.

Below: The cameras aboard the Viking take a good deal of time to build up each picture, so that if something were to walk past, only the footprints would photograph.

different principles common to Earth metabolisms. Scientists had agreed before the mission that a failure to detect a reaction would not necessarily indicate the absence of life on Mars; the assumptions about the nature of life processes might be all wrong, or the particular landing site might be barren. On the other hand, it was also understood that compelling evidence would be required before any positive results could be regarded as signs of biological activity.

The metabolisms of humans as well as microbes make use of oxidation and reduction in the process of consuming oxygen and producing carbon dioxide. The first experiment, looking for any gas exchange by measuring changes occurring in the gas levels inside the soil test chamber, showed that both carbon dioxide (CO_2) and oxygen were rapidly released from the dirt when the chamber was humidified with a nutrient solution. Later, when the same sample was actually drenched with the nutrient, the oxygen disappeared, and the production of CO_2 declined slowly.



© Rick Sternbach 1975

Dr. Norman Horowitz of the California Institute of Technology, a member of the Viking Biology Team, writing authoritatively in the November issue of *Scientific American*, applies "Occam's Razor" to help in interpreting these surprising results. This time-honored scientific principle* (and scourge of pseudoscience) separates intellectual knowledge from faith by saying that in a choice of hypotheses, the hypothesis most likely to be correct is *the one that can explain the greatest number of observations with the least number of assumptions*. Thus, it would seem more likely that the observed gas-exchange results are chemical in nature rather than biological, requiring for a non-biological explanation only two basic assumptions: that the dry Martian soil contains adsorbed CO₂ (which makes up the atmosphere at ground level to 95%) which is easily pushed out by water vapor upon humidification of the sample, and that the soil contains oxygen-rich compounds, such as peroxides, which decompose and release oxygen if they are exposed to water (with iron in the Martian soil acting as catalyst).

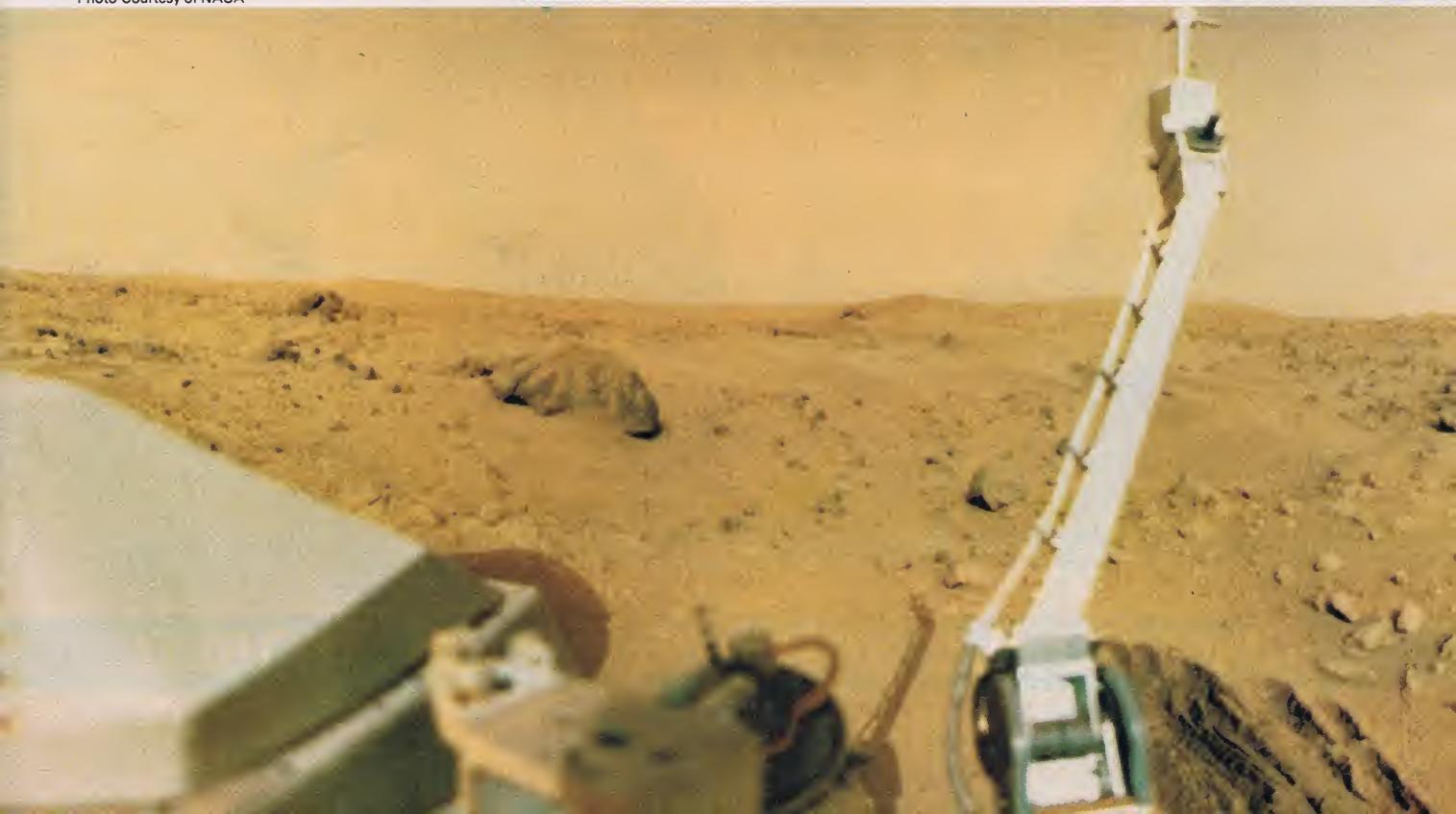
The second experiment was based on the principle that living organisms must "eat," that is, convert food into energy and tissue while releasing gases like CO₂. A liquid nutrient laced with

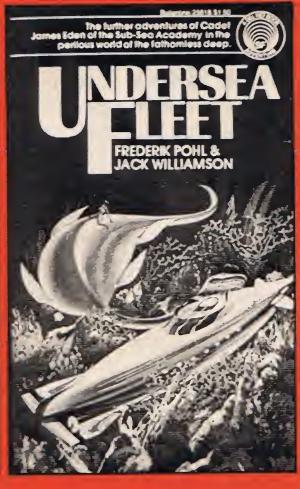
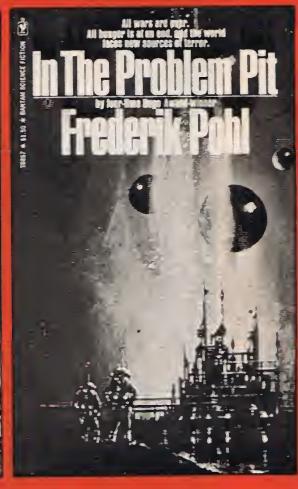
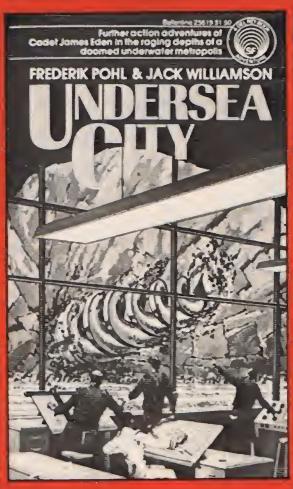
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*After William of Occam, English philosopher (ca. 1300-1349).

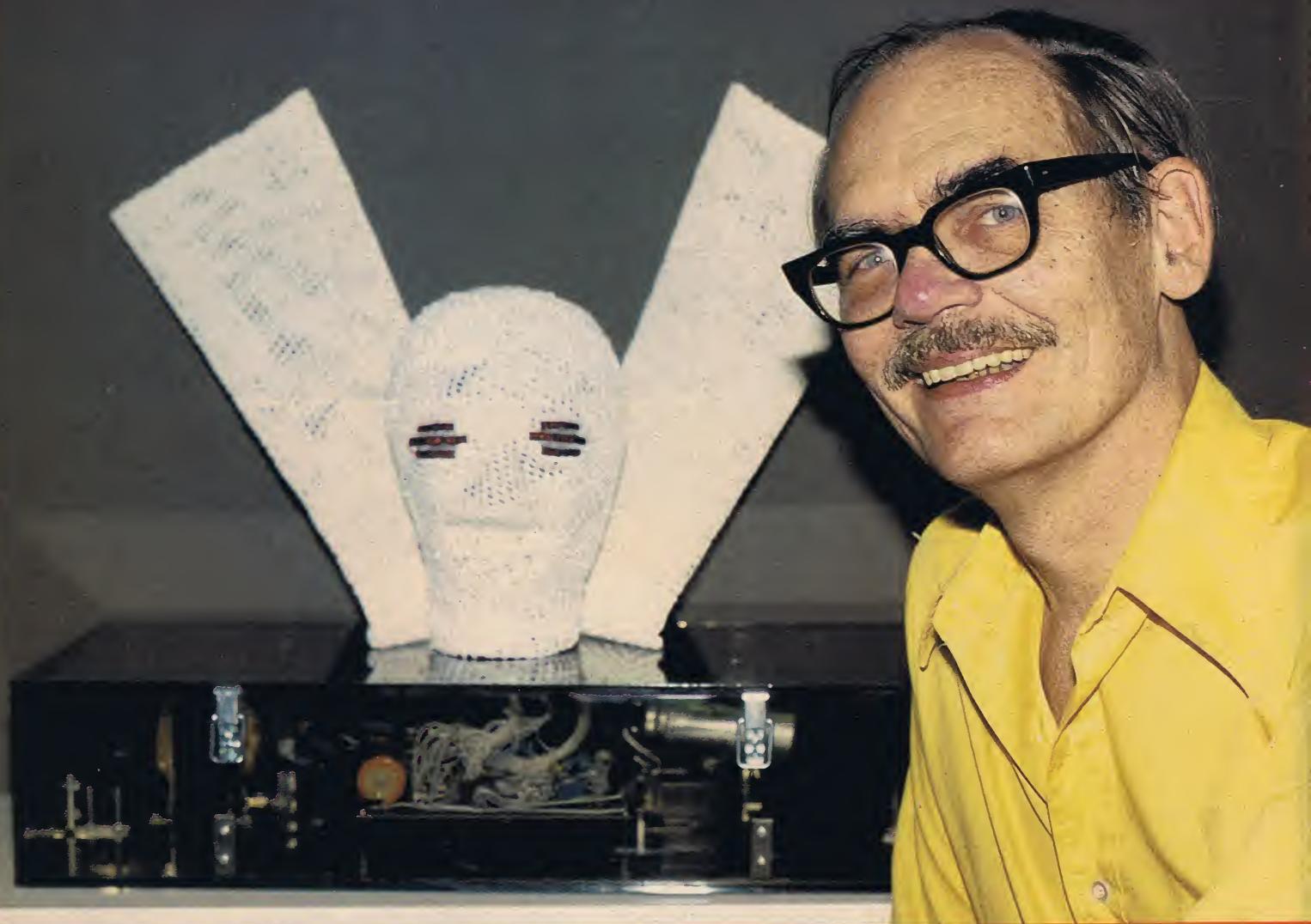
At right: Artist's conception of the Lander making its Martian descent. Below: 110° panorama taken from Viking 1. Soil samples taken from the trenches, visible on the right, up to 30 cm deep. The boom in the foreground carries weather sensors.

Photo Courtesy of NASA

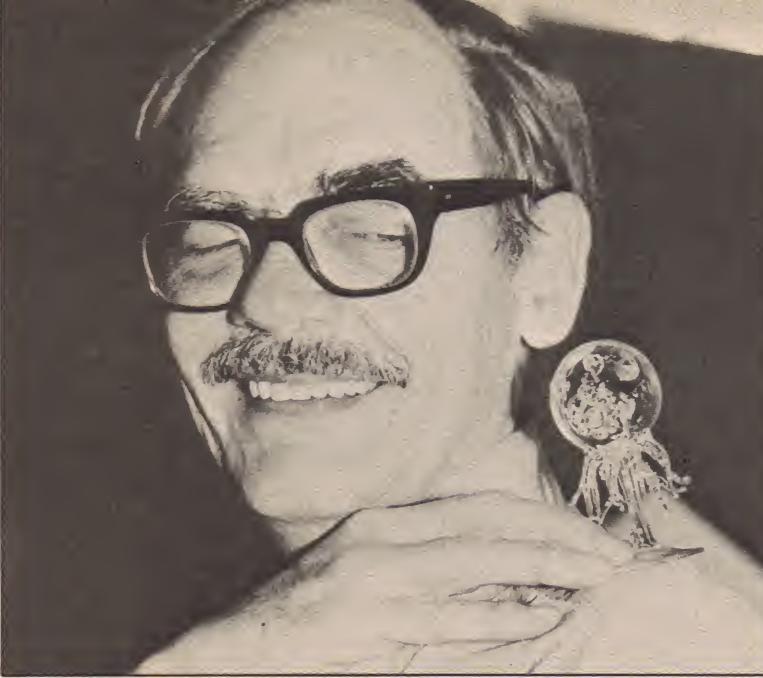




"THE VIEW FROM A DISTANT STAR"



FRED POHL'S SCIENCE FICTION WORLD



With an outer space friend on his shoulder, author Fred Pohl looks back on his forty year career as a science fiction writer. "I wrote my first piece when I was 15. It was accepted when I was 16. It was published when I was 17. I was paid when I was 18."

Photos: David Hutchison

By ED NAHA

Man lives in a science fiction world. He can fly at twice the speed of sound, travel the depths of the sea in nuclear-powered vehicles, cavort on the Moon's surface and send messages to alien life forms on long-playing records. RNA is deciphered. Laser beams are used at rock concerts. A firm in New Jersey builds a better brand of robot. This is the shape of reality in 1978. Yet it was all perceived and written about decades before in the genre of science fiction.

Science fiction is a literary artform vast enough to include both telepathic communication and Wookie warfare within its ranks. An artform that has endless scope, an infinite sense of wonder and, according to Fred Pohl, "... is one of the most misunderstood forms of literature in existence." Pohl shrugs his shoulders and adds, "I'm not sure why."

Pohl tilts his angular body over his desk and pauses mid-sentence to light a cigarette. He is celebrating his 40th year as a science-fiction writer ("I've been writing for 40 years and I'm just starting to get the hang of it."). Starting off as a teen-aged fan before emerging as a teen-aged writer and editor, Fred has won four Hugos (both as a writer and editor), a Nebula Award for his recent *Man Plus* novel and The Edward E. (Doc) Smith Award. He has written such renowned works as *Day Million*, *The Gold At Starbow's End* and *Gateway* and co-authored (with C.M. Kornbluth) such classic SF as *The Space Merchants*, *Search The Sky*, *Wolfbane*

Fred Pohl relaxes with the electronic sculpture he commissioned for his *Man Plus* novel. The insect creature was constructed by Michael Maycock and emits bursts of light.

and *Gladiator-At-Law*. He has weathered the era of the pulps, the "B" movies and the New Wave and is now witnessing the first effects of *Star Wars*-*Close Encounters* mania.

In spite of science fiction's newfound popularity, Pohl feels that the genre is still misinterpreted by the public-at-large. To some, SF is mere juvenile antics; Flash Gordon . . . ray guns . . . mad labs . . . Frankenstein . . . furrowed brows.

A Difficult Task

"I think science-fiction writers deserve a certain amount of compassion and tolerance," Pohl says, "because they are in the business of constantly saying things that they *think* might be possible. And this can be dangerous. They are often accused of being cynical or fatalistic. But their job is to say what *might* happen. They're not trying to tell you what *should* happen. And they shouldn't be held accountable if much of what they see as possibly taking place is bad. They're not pessimists. They're not mean-spirited. They're not trying to depress the world. They're only trying to show what everyone should be thinking about—what the possible consequences of what is being done today might be ten or a hundred years from now."

This visionary element in science fiction has led to the belief, in some circles, that SF literature is nothing more than a collection of paranoid tales designed to create a gigantic "I told you so" effect. The recurrent criticism is dismissed by Pohl as being way off the mark. "There has always been an undercurrent of worry in science fiction," he admits, "But there has always been an undercurrent of worry in everyday life. SF merely exaggerates, crystalizes the points. I remember a story called *The Revolt Of The Pedestrians* by David H.

Keller. It was suggested that, since people are so used to driving cars, by and by their legs would simply atrophy and they'd be born with tiny little stumps. In the future, no one could walk anywhere. They'd live very regimented and unpleasant lives. Grotesque. Well, I haven't seen the legs falling off any drivers yet, but they are using their cars more than ever. And they often lead very regimented lives because of it." Keller's story was published in 1928.

Pohl sees the historic role of science fiction as being a positive one, even during its more cautionary periods. "I think SF has always had the role of social conscience," he points out. "Although there certainly was more optimism during the twenties and the thirties in SF than there is now. In those days, the world had not yet learned that there is always a price to pay for technology. You invent the automobile and you get air pollution. You invent TV and you get cancer-producing rays. You also get commercials . . . which isn't healthy, either. During the thirties, we hadn't yet realized that nuclear power might mean mass pollution of the environment; might mean destruction. We were naive, in a sense. Recent science fiction has tended to be a bit more pessimistic about the consequences of science and technology but it's also been more realistic and, perhaps, a lot more influential."

It's All Around Us

Fred believes that science fiction has influenced the world, and a lot more strongly than some of its detractors give it credit for. "I think people pay attention to SF either directly or indirectly. They might never know that SF exists, but someone else is reading science fiction and bringing certain ideas to their attention. Books like Alvin Toffler's *Future Shock* would never have been

SF artist Boris' conception for Pohl's latest work, *Gateway*. The novel deals with an alien space station of unknown origin.

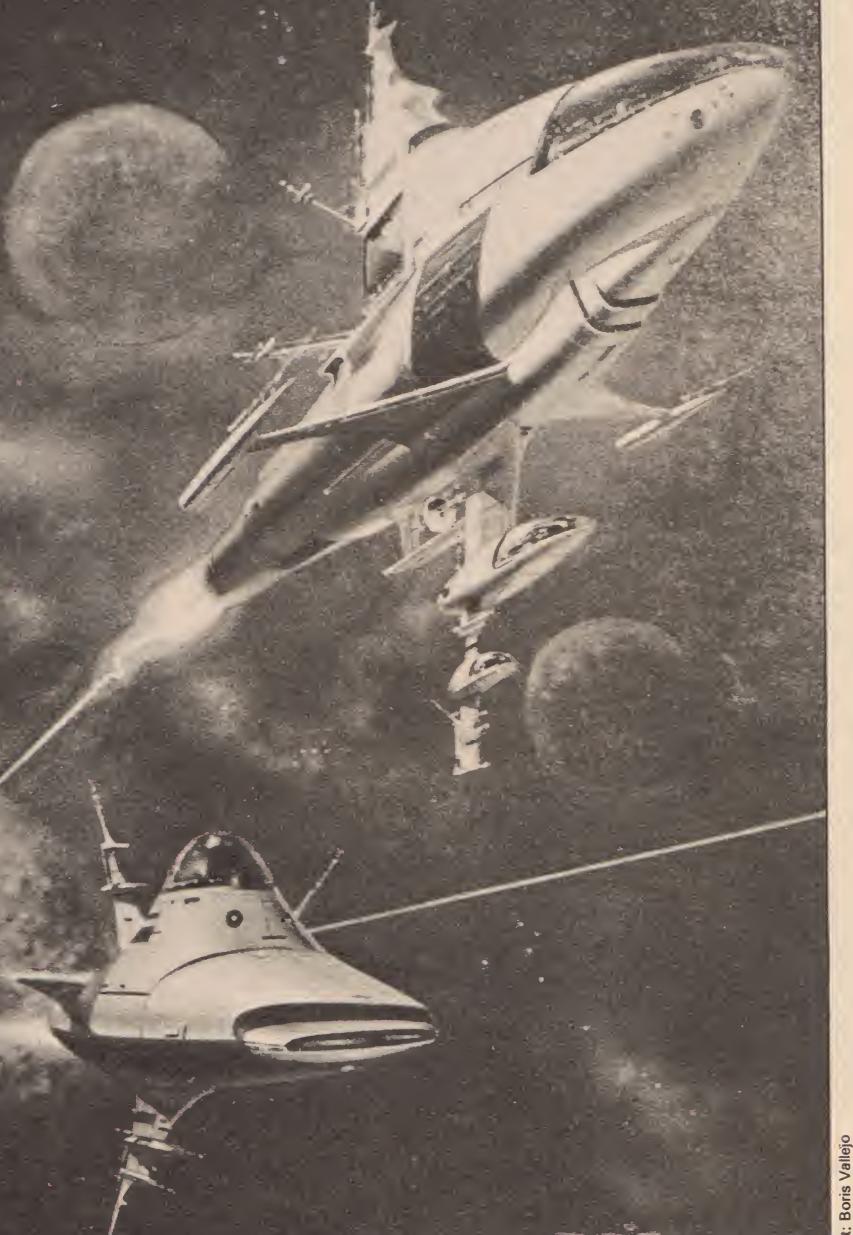
written if it wasn't for the great body of science-fiction literature that suggested what he was talking about. He reached an audience that doesn't read science fiction, but there is not one concept in his book that doesn't come from science fiction in some way. This is true of a lot of books, movies, television documentaries and a lot of courses in colleges that tell us about the possible future."

According to Pohl, the effects of SF are all around us. "There's a whole study of the future called *Futurology*. You see it in things like the World Future Society and in the works of the Rand Corporation in California and the Hudson Institute in New York. They're really *think tanks* making studies of the future. And a lot of directions they are taking, a lot of the concepts they are studying come from science-fiction magazines. There are a lot of people who will pay attention to THEM who have never read an SF story. So, either directly or indirectly, science fiction is making itself felt."

Although SF literature has historically made valid contributions to society, Pohl is still at a loss to explain why it is often considered to be apart from mainstream fiction. "Oh sure," he admits with a chuckle, "there was a time when I would read *Amazing Stories* with the cover pulled back so people wouldn't know what I was reading. With the magazine hidden under my coat. But that was during the era of pulp . . . and there was a lot of science fiction that was bad pulp."

"But there was always a kind of science fiction that was being written that was considered respectable. Huxley's *Brave New World*. Orwell's *1984*. Stapleton's *Last and First Men*. There were always people like that who were considered important. H.G. Wells was not looked down upon by anybody. The problem has always been, a lot of people are so set in their minds about not liking science fiction that if they like something, it's automatically *not* science fiction. There are authors today like Michael Crichton who write mostly pure science fiction. But they never call it that and so it sneaks by the public's automatic defense system."

Pohl doesn't necessarily believe that SF's backseat position in literature has been detrimental in terms of creativity. "I don't think that every word of science fiction written *should* reach a mass audience," he theorizes. "I think there is some kind of SF that is better written if it is aimed towards a smaller audience. An author can say a lot more, can be understood in greater detail, if he's dealing with this select, responsive audience. Maybe a Michael Crichton or an Aldous Huxley might have a hard



Boris

Fred relaxes with some good reading. "I came across an SF magazine when I was 10 years old. I was an editor when I was 19."

time saying the same things to their larger audiences."

Because of the *Star Trek*/*Star Wars* phenomena, Pohl views science fiction as being THE next literary fad. He envisions both positive and negative rewards from SF's current popularity. "The anti-science-fiction prejudice is no longer very widespread. I think it might be limited to a few old fogies like one book reviewer at *Newsweek*. He reviewed a science-fiction book a few months back by A.J. Budrys. He loved the book but felt that he had to begin the review saying 'I hate science fiction.' But he thought that this *particular* book was wonderful. Now, there are a few people like him still around. It's their problem that they hate anything connected with SF. Not mine.

"Science fiction isn't looked down upon anymore. There are something like 2,000 colleges around the country teaching science fiction as a regular course, not counting any number of high schools which offer similar courses. There are people getting doctoral degrees by writing dissertations on SF. There are foundations set up for the study of SF. So, right now, it's about as respectable as anything needs to be. And, in a way, that is not at all towards the greater good. It's made a lot of SF writers a little more self-conscious than they would otherwise have been.

"It's bad enough when you have to sit behind the typewriter and worry about what will please you, your readers and your editor. When you also have to worry about what's going to please a

Photo : David Hutchison



critic or some college professor or some graduate student who may be doing a thesis on your work . . . you just have too many people looking over your shoulder when you start to type. And it's a temptation to do the same sort of thing that they've liked you doing before.

"Whereas in the old days, with the pulps, when nobody took what you were doing seriously, writers would experiment more, were much more radical. But good science-fiction writers are very stubborn people. I think they'll be able to resist that pressure better than most."

Sturgeon's Law

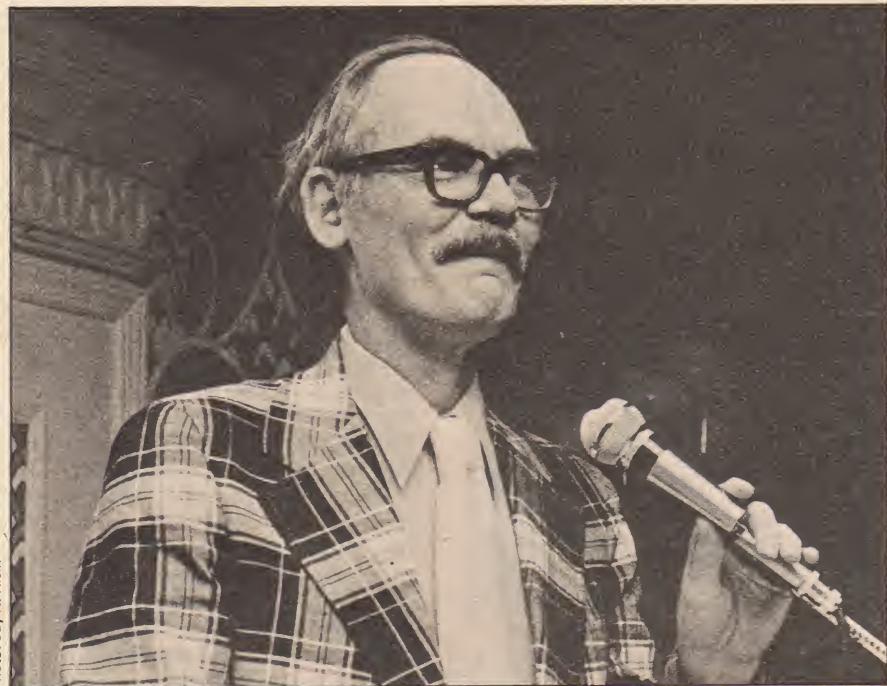
In spite of the current SF boom, science fiction is still awash with clichés. The mad scientists. The girl-happy

robots. The evil aliens who eat innocent children. Pohl believes this tarnished image of SF literature stems from the popularity of SF-TV shows and films. For many people, the giant bugs from Venus or the high-heeled catwomen from the Moon are their ONLY contact with the SF community. Thoughts such as this make Pohl shudder. "I think that most SF on film and television has been pretty second-rate. The reasons for that are obvious. Most science-fiction films have been exploitation films, made as cheaply as possible by people who know nothing about science fiction. You ask most people what an SF movie is and they'll tell you 'Yes, I saw one. It had this giant termite eating Tokyo.' Or 'It had this wise old scientist saying: Yes. Yes. The Earth has run out of fuel. We must go to Mars and get some more.' These are, of course, examples of one type of SF, but they're not what science fiction is all about.

"For Hollywood, the advantages of these films are: 1) they're easy to make; 2) they fill the bottom half of a drive-in double bill quite nicely; and 3) they require all the kind of care that you would expect. I ran into a producer of these films a few years ago. He had produced one of the worst science-fiction films ever made and I had just seen a private showing of it. He wrote the script. He was telling me that he didn't think it was very hard to write science-fiction films, because whenever he would run out of ideas, he'd just browse around his bookshelf for a while. He had files of every science-fiction magazine and book ever written. Well, I should have strangled him. Not only was he stealing other people's ideas, he didn't even understand what the ideas were. Unfortunately, there are too many people like that making science-fiction films. But that's true of everything, I guess. Ted Sturgeon says that 90% of science fiction is crud.. Well, 90% of everything is crud: STURGEON'S LAW."

Turning his vision to TV's anemic

Photo: Jay K. Klein



At the podium, Fred Pohl addresses a gathering of science-fiction enthusiasts. "One of the great things about going to conventions for me is that I meet people there who know more than I do about almost any subject there is. They read . . ."

science-fiction realm, Pohl becomes truly exasperated. "The thing that troubles me most about American television SF has nothing to do with the creative people involved in it," he states emphatically, "but a lot to do with the prevailing network superstitions. Networks insist that they can't do anthology shows, only series. They want the same *Six Million Dollar Man* or Mr. Spock coming back every week, doing pretty much the same things. But that's a terrible waste of one of the greatest strengths of science fiction . . . its ability to say stimulating things about all sorts of possible futures, in infinitely different circumstances. I think the best science-fiction program that has ever been on American TV was the old *Tales Of Tomorrow*, back on the DuMont network in the dawn of time . . . the fifties. They had a different story each week by people like Arthur Clarke and other top SF writers. They had a budget of maybe a dollar seventy-five per show and the scenery tended to ripple in the breeze . . . but they were grand."

Better Read Than Viewed

Pohl realizes that, in 1978, it's possible for an SF fan never to actually *read* science fiction. For a lot of present day buffs, television and movie science fiction is the *only* kind of science fiction. Some film and TV boosters insist that SF in book form is a failing proposition. The "new" New Wave will consist of *Star Wars* and *Close Encounters* spin-offs. Pohl considers this kind of thinking a rather unique form of insanity. "People talk about the printed word being dead. There are more books published every year than there were the year before. Last year, there were almost 1,000 new SF books published in the United States. Next year, it will be over 1,000. I think the audience is there. There is something here that they want that they can't get anywhere else. I think they will force themselves to read to get it. I think that science fiction in book form can do many things that science fiction in film cannot."

"If you do a story about a Martian, you can describe him any way you want to—and the reader can envision him in his mind as real. If you show him on a television program or in a film, you have to build a papier-mâche monster. And no matter what you do, it looks like a papier-mâche monster. Even something like the robots in *Silent Running* or the Wookie in *Star Wars* are limited. They're interesting. They work beautifully. They're technically superbly done. But they're about as far as you can go. You can't really show a creature with six legs and scales on the screen. If you do, it will probably come out comic, or maybe terrifying. But it certainly will never possess the warmth of a person. In SF literature, you can

read about a creature on another planet and understand that it has feelings, emotions, a life that includes friends, foes, rivals. And accept it that way. That's one of the things that printed science fiction can do that visual science fiction does very poorly . . . if at all.

"Also, a lot of SF literature tells you things that you don't know. It gives you information that you would not otherwise have. Films and television tend not to do that. It slows down the action. So, you will find a *transporter* in *Star Trek*. Nobody ever says what a *transporter* is. It's magic. It's a machine you get into and go somewhere else. If that was done in an SF *story*, it would say that a transporter is a device which rotates you into the fourth dimension or something like that. And the author would perhaps tell you something that you didn't know about the physics of the universe, or geometry, or something else. There's just no explanation in visual SF.

"A lot of people I know have learned a lot through printed science fiction. A lot of scientists I know were turned on to science by reading SF. They were motivated into trying things that they might not otherwise have attempted. I don't think much visual SF has offered equal inspiration."

Pohl mulls over his verbal defense of the written word before concluding: "I think printed SF will be around for a while. I think it will be around forever. For one thing, it's hard to bring a television with you when you're sitting on a park bench waiting for your girl friend to show up. You're sitting in an airplane or you're waiting for something to happen or you're trying to sleep late at night. A book is really the most conve-

nient source of information or entertainment that you can have. It's compact. It's cheap. It's durable. You can use it over and over again. And it contains within it anything you might want to know . . . from book to book."

Open Your Mind & Think New Thoughts

As popular as science fiction is growing and, despite its countless virtues, Fred is aware that some writers feel that it is *below* them to be associated with the term "science fiction." Pohl, on the other hand, loves his work, his genre and his fandom. "I know writers," he says simply, "who get terribly uptight if they are approached as a science-fiction writer as opposed to just a 'writer.' But I'm not ashamed of that 'label.' I'm proud of it. Science fiction is harder to write than most kinds of fiction. It demands not only that you have certain literary skills, have the ability to observe the things that go on in the world around you, but that you have the ability to invent concepts that nobody else has ever thought of. You must have a free-wheeling imagination. You need *all* the skills that a normal writer needs *plus* the special skills needed for science fiction. I've always enjoyed SF. I started reading it when I was in grammar school and I have no intention of ever stopping. I found it very congenial to me. I admire the readers of science fiction. I think they're a select group in the world. And if anyone chooses to regard it as something a little below the dignity of a human being, I can only feel sorry for them."

'Fred Pohl leans back in his chair after hastily stubbing out his cigarette. He currently is Science-Fiction Editor at Bantam Books, but it's clear from his conversation that he is just as much a science-fiction fan now as he was over forty years ago when he, Damon Knight, C.M. Kornbluth, and other would-be writers formed their own science fiction appreciation society, The Futurians. For Fred Pohl, the magic has never left science fiction . . . and never will.'

"A really good science-fiction story makes you think thoughts you never would have thought of any other way," he marvels. "It's not just an entertainment you get when you're reading it. When you're done it leaves concepts in your brain that make you wonder about 'what might happen IF . . .' It gives you a view of the life you lead now, the world, the society you're part of, that is totally unique. It suggests what possible alternatives there are, what other types of life there might be . . . It gives you what astronomers call 'the view from a distant star.' Science fiction gives you a glimpse of the world from the *outside*. There's no other kind of writing that can do that for you."



Early Pohl: "I wrote a terrible story when I was 12 about Atlantis. I just kept trying."

hardware

some of the latest gadgets and innovations from inventors and manufacturers

By DAVID HUTCHISON



A concept fostered by a NASA scientist for studying X-ray sources in space has led to a handheld X-ray instrument which produces an instant image with a small source of radioactive material. Powered by a single pen battery, the prototype model pictured here, is a rugged device exhibiting a high potential for screening and other uses in medicine, dentistry and areas of industry. The most obvious promise of the unique unit is for emergency and other field use where a quick fluoroscopic examination is desirable. Potential applications of the portable instrument range from examination of a football player's possible bone injury on the field to detection of welding defects or gas leaks in pipes.

The device was developed by Dr. Lo I Yin, an X-ray researcher at NASA's Goddard Space Flight Center, Greenbelt, Md. The new device is called a Lixiscope (for Low Intensity X-ray Imaging Scope). Although the device is not yet on the market, it is estimated that production units could cost less than \$5,000 each, based on existing component costs. No new technology was required for the Lixiscope. In addition to the night vision image intensifier, it incorporates other off-the-shelf items including a radioactive source and an X-ray phosphor screen.

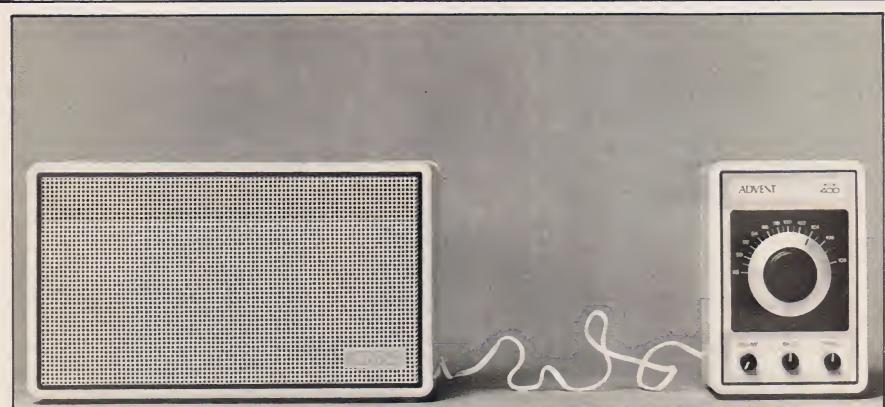
The pull of a trigger unshields the radioactive source, sending a low dosage of X-rays into the object being examined. The X-rays passing through the object are absorbed by the phosphor screen which converts them to visible light. The night vision unit, which employs fiber optics, intensifies and channels the visible light to its viewing screen for image display.

Inventors and manufacturers are invited to submit items for inclusion in this column. Please forward all information to David Hutchison, Science Editor, FUTURE, 475 Park Ave. S., 8th floor, NY, NY 10016.



The Miniscope Model MS 15, manufactured by Non-Linear Systems, Inc. is a field portable miniature oscilloscope that utilizes the latest low powered integrated circuits. The manufacturer claims that the operating characteristics are such that the

Miniscope will handle all of the measurements needed in servicing most electronic equipment. Portability means that the repair technician will no longer have to remove heavy equipment from its rack for servicing in his truck or shop. Imagine, that with tools and a good digital multi-meter, an entire diagnostic electronic shop may be carried in a brief case. No more expensive delays while equipment is dismounted and carried off to the shop. The complete instrument with internal rechargeable batteries weighs only three pounds and is 3.1" high, 6.4" wide and 8" deep thereby allowing it to be contained within most tool boxes or an attache case. Fully charged the unit is capable of four hours of continuous use. This portable instrument sells for \$287.00 and is available from Edmund Scientific Co., 101 East Gloucester Pike, Barrington, NJ 08007; product number 72,394.



Advent's FM Radio Model 400 is a two piece unit (tuner/amp and speaker) of surprising quality (for its size). The separate pieces allow the tuner/amp to be placed at the most convenient spot to change stations and adjust volume and the speaker to be placed wherever it sounds best—on the floor reflecting off the wall or some convenient shelf. The Model 400 is designed for use in homes, dormitories, offices, etc. for people who are accustomed to high quality music reproduction and cannot afford either the money or space for a second high-quality component system.

The tuner/amp measures 6 5/8" high by 6" deep by 11" wide and weighs a mere four pounds. The speaker, whose response is tailored specifically to match



the tuner/amp is 6 5/8" high by 6" deep by 11" wide and weighs 5.5 lbs. The quality of sound just has to be heard to be appreciated and has amazed testing experts at High Fidelity, Audio and Popular Science. Suggested retail price: \$140.

Years before Spielberg's current \$19 million extravaganza, movie audiences were treated to a vision of future contact with alien beings. With less budget than a catered wedding, and with less than a week of shooting, this 1950 "C" movie proves what miracles an artistically attuned director and a dedicated cast can work upon the motion picture screen.

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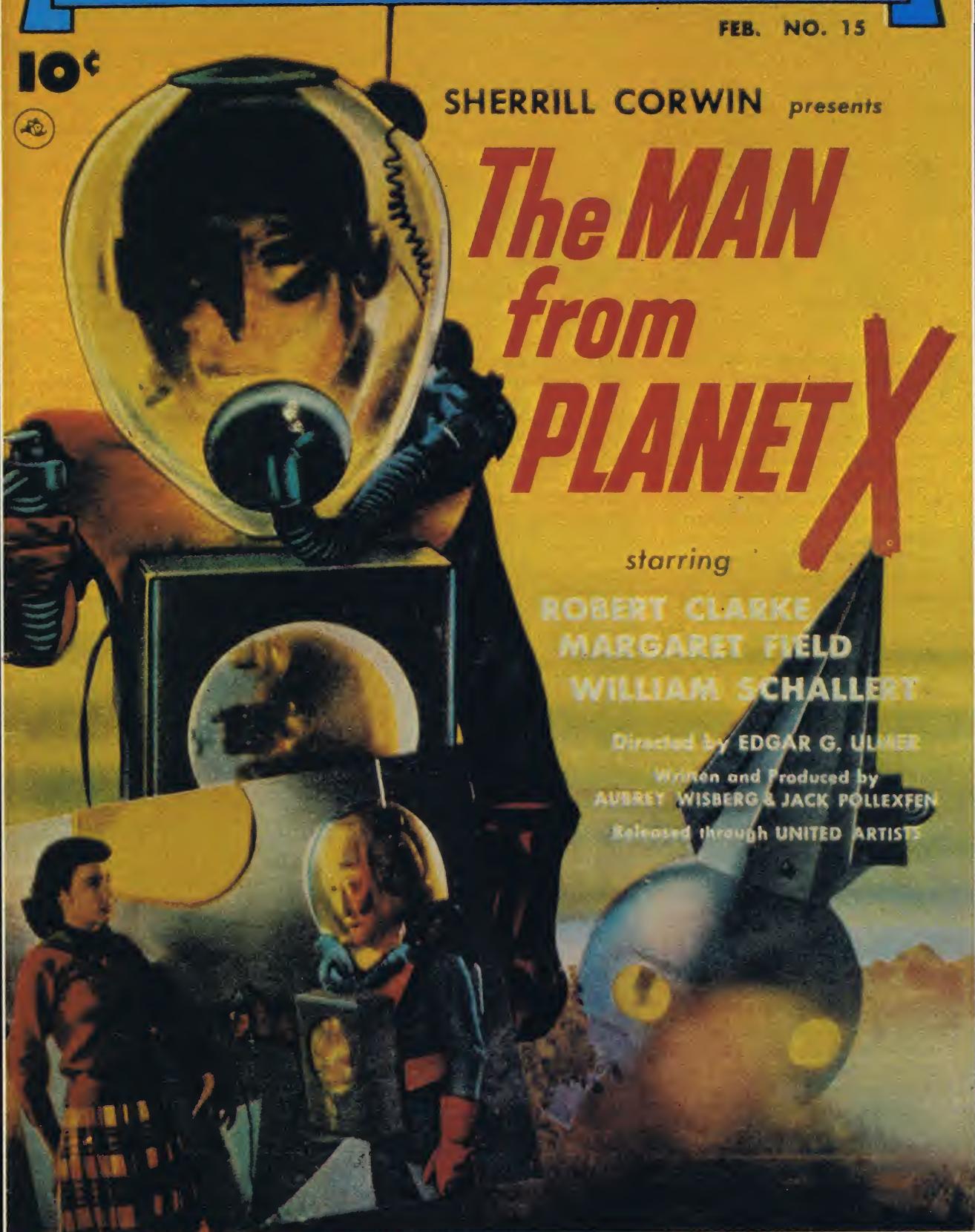
SHERRILL CORWIN presents

The MAN from PLANET X

starring

ROBERT CLARKE
MARGARET FIELD
WILLIAM SCHALLERT

Directed by EDGAR G. ULMER
Written and Produced by
AUBREY WISBERG & JACK POLLEXFEN
Released through UNITED ARTISTS



The cover of the 1950 *Man From Planet X* "Fawcett Movie Comic."

By ROBERT SKOTAK

It was just a little film—just a modest science-fiction story produced in a few short days in 1950 and subsequently lost among a great array of big studio/big money releases. As a result, today *The Man From Planet X* is hardly seen, almost as remote and inaccessible as the island on which the story takes place. Although the film has been overshadowed in these *Star Wars/Close Encounters* days, it struck a chord in those who saw the initial release—a chord that is still resounding twenty-eight years later.

The Man From Planet X went into production at a time when the motion picture industry, just beginning to feel the negative effects of television, was undergoing a surge of revitalization from the science-fiction genre. *Destination Moon* and *Rocketship X-M*, having made big impressions at box offices across the nation, brought the true worth of science fiction: money.

The “invasion from space” concept was already deemed to have big box office potential by the money people, and everybody jumped on the bandwagon: Independent producer Edward Alperson was beginning work on a project entitled, *Invaders From Mars*; at Paramount, *War Of The Worlds* was slated for production; over at R.K.O., *The Thing* was already one month into production when *The Man From Planet X* began filming at the Hal Roach Studios. The prime directive in the making of this film was the same as countless other “B” and “C” pictures at the time: Spend as little as possible, but make as much as possible! Consequently, the producers, Aubrey Wisberg and Jack Pollexfen, pared down the budget to a paltry \$50,000 and cut the shooting schedule to six days.

“We have six or seven backers in our company,” Wisberg stated at the time, “but our own money is in this venture, too. This kind of setup has the advantage of making a writer conscious of costs. As writers, we recognized and anticipated the time and budget limitations in our script in advance and are now able to cut corners on the set.”

Wisely, Wisberg and Pollexfen chose as their director one of the few men in the film industry who could work within the constricting limitations of their production—Edgar Ulmer. It was primarily due to Ulmer that the film was able not only to surmount the endless practical considerations of production, but to create an atmospheric mood rare-



Photo: © United Artists Corp.

“It’s maddening,” the Professor exclaims, fully realizing the importance of this encounter, “we may only stare at each other.”

ly attained in a science-fiction film. In the final analysis, the mood became an important stylistic factor in underplaying the film’s theme of human greed so that it doesn’t come across as a preachy message, but rather emerges naturally from Ulmer’s smooth blending of style and content.

The story is based on a rather rare science-fiction premise: The arrival of a peaceful alien from a dying planet who turns to violence only as the result of human hostility and greed.

The setting is the fog-bound island of Burray in the Orkney Islands, north of Scotland. Reporter John Lawrence (Robert Clarke) arrives at an appropriately ancient, castle-like structure called a “Broch” (pronounced “brok”). Within its gloomy confines lives an old friend of his, Professor Elliot (Raymond Bond). Elliot has invited him there to witness the mysterious approach of a new and unidentified

planet bearing the designation “X.” Of all the places on Earth, the movements of Planet X are most clearly observable through a telescope from this remote island.

Living with the professor in the Broch are his daughter (Margaret Field) and the professor’s assistant Mears (William Schallert)—a man Lawrence knows to have a shady past. Significant to Ulmer’s overall subdued handling of the film’s themes, no specifics are ever given of Mears’ past crimes, so that he quickly comes to represent the personification of the darker side of human nature in general.

Lawrence and Enid are immediately attracted to each other. They go for a stroll at night on the surrounding moors, which is a place of gnarled trees and barren windswept ridges submerged in a sea of fog. A flash of light in the sky startles them. Moments later they come upon a spear-shaped projectile that has just fallen from space.

Back at the Broch, the scientists surmise quickly that the metal of which the projectile is made possesses highly advanced qualities. Mears, caught up in the excitement slips and greedily exalts that, “This could be millions! If the formula could be reproduced, the man who controls it could control the industry of the world!”

Later, Enid drives Lawrence to a nearby village inn. En route back she has a flat tire and before long finds herself wandering home amid the swirling mists. She stops suddenly when she spots an eerie light flickering through the fog in the distance. She walks toward it and comes upon a large silvery sphere—a ship from another world. It is a beautifully realized scene depicting the classic confrontation between Man and the Unknown.

Enid is further startled by the sudden, jolting appearance of an unearthly face at the ship’s porthole—an apparition that sends her fleeing to the security of the Broch. She frantically describes the thing’s face to her father as “A ghastly caricature! Like something distorted by pressure—a horrible, grotesque imitation of a face!” An excited Professor Elliot believes that this might be a being from Planet X.

He accompanies Enid back to the sphere, but they find no trace of the creature she described. The next night the professor returns to the sphere again, this time with Lawrence. Upon their arrival they are confronted by the bizarre creature itself: It is short and thin with a bulbous head encased in a



From the collection of Bob Burns

Above: The original rubber head mask of the Planet X alien as it appears today. Below: The alien gets a helping hand from technicians on the Hal Roach studio lot before setting off to confuse earthlings.



The eerie atmosphere of the Moors dominates much of the film, thanks to Edgar Ulmer.

creature and twists the air flow control on his space helmet. "We're going to ration this," Mears threatens, "and you're going to start earning it."

As the story progresses, the professor, unaware of Mears' schemes, is taken ill and Lawrence goes into the village to obtain medication. Enid, meanwhile, attempts to free the imprisoned alien from the dungeon—only to be kidnapped by the now unfriendly creature and taken back to the sphere. Soon after, numerous villagers turn up missing. It is learned that the alien is using a hypnotic beam for purposes of creating a small army of slaves who are forced to fortify the space ship from possible attack. The alien, now wise to man's hostilities, is preparing his defenses.

In the skies above, Planet X is making its nearest approach. What was originally intended as a peaceful emigration to Earth by the aliens from the slowly freezing Planet X may now become a violent invasion. In the final minutes, Lawrence, aided by the local Constable (Roy Engel) secures help from Scotland Yard and a heavily armed military attachment. Lawrence makes a last-ditch effort to save Enid, Mears and the other hypnotized captives of the alien by sneaking into the encampment and ordering them to escape one by one. Before he can reach Mears, Lawrence is attacked by the creature itself. He narrowly escapes and just as the Man from Planet X begins sending the first directional signals to his home planet, artillery and bazooka shells blast the ship, its alien occupant and the hypnotized Mears into oblivion. The earth trembles violently, and powerful winds buffet the moors as Planet X swings menacingly close to Earth before swerving into a different orbit that carries it deep into outer space. The threat is over.

Photos: © United Artists

Made at the beginning of a new decade, *The Man From Planet X* took on a symbolic quality: Hollywood was starting to turn away from the "haunted castle" supernatural thrillers of the 30s and 40s as a whole new space-age era of entertainment, couched in the jargon of modern science, was being ushered in. *Planet X* neatly bridged the gap between the two traditions. The castle setting, the ever-foggy moors, the superstitions of the local villagers who fearfully refer to the space man as a "ghost" and "bogie" all create a gothic atmosphere that contrasts with the ultra-modern spaceship, the scientific equipment and theorizing, the laser-like hypnotic beam and the futuristic look of the alien itself. Many elements in the film work in a gothic horror as well as science-fiction manner: The creature's strange glow and humming sounds, for instance, gives it the appearance of being both a ghost and a super-advanced being from outer space. In no other film has such a blend been successfully worked.

Making *The Man From Planet X* challenged the artistic abilities of director Ulmer, and he responded beyond the call of duty. In doing so he drew upon his vast experience as art director of past fantasy subjects like *The Cabinet Of Dr. Caligari*, *Metropolis*, *Nosferatu*, *The Phantom Of The Opera*, *Hunchback Of Notre Dame*, *M*, *Faust* and a hundred other motion pictures. He'd earned the reputation of being able to make something out of nothing—*Planet X* is no exception.

In many ways the imaginative solutions he arrived at due to economic considerations gave it a memorable quality that might not have occurred had the standard, expensive approach been taken. A good example is the alien itself, which is described in the script as having a face "twice the size of the average man's . . . the skin appears pulled tightly over the bone structure, giving a bizarre mask-like appearance." It's one thing to describe something as a mask in words and quite another to create it in actuality for a motion picture so that it wouldn't get laughs of disbelief! No attempt is made in the film at animating the face in any way. It is obviously an unmoving, rigid mask without visible eye movements or means to change expression. Yet it is highly effective due to the clever way in which Ulmer created expressions on the creature's face. He placed a hidden light aimed up at the mask within the space helmet: By manipulating the light a tiny bit he was able to subtly alter the mask's expression (which had been sculpted with numerous small wrinkles, bumps and contours) through mere shadowplay.

Other examples are obvious but work well in the film. The extensive use of fog not only disguised the use of the same exterior sets over and over, but, more

Photos: © United Artists



Caught by the hypnotic beam, the Professor "stands, strangely immobile and attentive . . ." (From the Wisberg-Pollenfex screenplay.)

importantly, was employed by Ulmer with an intelligent variation that established changes of mood and aided the suspense elements of the plot. The use of a standard focusable spotlight to represent the hypnotic ray was far more effective than many an expensive optical effect in other films. Likewise, the impressionistic manner in which the near passing of *Planet X* is suggested—buffeting winds, the moving glare of a passing arc light, the rushing camera movement toward, than away from the terror-stricken actors—is somehow as effective as the final effects-filled moments of *When Worlds Collide*.

The production values received an added boost from the use of some of the standing sets from the Walter Wagner epic *Joan Of Arc*. Ulmer's key use of these sets, the use of Scottish accents and his close attention to minute background details all contribute so well to the air of authenticity that audiences assumed the film was shot in England rather than at the Hal Roach Studios in Southern California!

The one real flaw of the film is its overly talky script which suffers from the use of awkward phrases and expressions. Largely due to the fine performances of actors Robert Clarke, William Schallert and Margaret Field, this problem is minimized.

The Man From Planet X is low-budget filmmaking at its creative best. It obviously had something—that hard to define quality that makes it stand out among dozens of similar productions. Over the years it has attained the stature of a minor science-fiction classic. Its subdued theme pointing up human curiosity vs. mindless greed; the contrasting portrayal of a sympathetic alien; the unique blending of the old and the new, and its artful design make *The Man From Planet X* a fitting tribute to the genius of Edgar Ulmer and a fine cinematic example of an "encounter of the third kind."

MAN FROM PLANET X CAST AND CREDITS

THE MAN FROM PLANET X: A United Artists film, 1951. Black and White. 70 minutes. Produced by Aubrey Wisberg and Jack Pollexfen. Directed by Edgar Ulmer. Original Screenplay by Wisberg and Pollexfen. Director of Photography: John L. Russell. Production Design: Edgar Ulmer (uncredited). Art Direction: Angelo Scibetti. First Assistant Director: Les Guthrie. Edited by Fred C. Feisthans, Jr. Special Effects: Andy Anderson and Howard Weeks. Optical Effects: Jack Rabin (uncredited). Music by Charles Roff. Sound: William Randall. A Mid-Century Films Production.

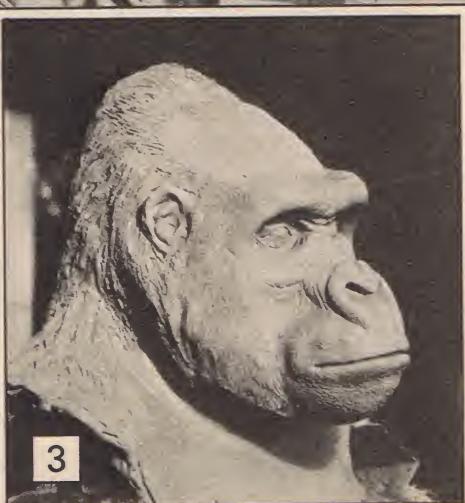
John Lawrence	.....	Robert Clarke
Enid Elliot	.....	Margaret Field
Prof. Elliot	.....	Raymond Bond
Dr. Mears	.....	William Schallert
the Constable	.....	Roy Engel
Geordie	.....	Charles Davis
Dr. Blane	.....	Gilbert Fallman
Inspector Porter	.....	David Ormont
The Man From Planet X	?	

The alien starts off for home. To this day, the actor who played the alien is unknown. *The Man* never earned screen credit.

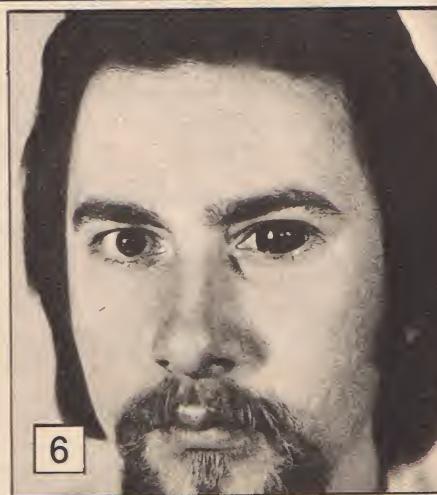


RICK BAKER: Gorilla-Maker At Large

Rick Baker, now famous for his portrayal of King Kong gives us an over-the-shoulder look at Kong's creation.



Rick Baker's interest in apes and gorillas was spawned from a twelve year old's fascination with zoos. Since that time, his profession as a makeup artist has given him the tools to spend his time "building the better ape" suit. (1.) This design sketch in clay was done from memory and after his association with *King Kong*. (2.) Early on, the producers of *Kong* had envisioned him as more of a missing link, than a giant gorilla. This sketch of *Kong* was more human-like and had a smaller head. (3.) This was the final design for *Kong*. After shoving it to Dino, the clay sketched hair was removed and molds were made from the clay. (4.) Rick and his assistant David Celitti are building up the clay figure of *Kong* on Rick's plaster body cast. A cast was made of Rick's body, while he was standing with his knees slightly bent. Assisting in the arduous process were his wife, Elaine,





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John Burk, and Rob Bottin. Urethane foam was used to make the positive cast from the plaster bandage negative mold. Another plaster mold was made from the urethane positive. (5.) Here a complete urethane foam casting built onto the plaster body cast is shown for a test. (6.) Rick demonstrates the difference between human and gorilla eyes. The effect is achieved by means of a scleric contact lens. The lens covers the entire eye and up under the upper and lower lids by almost a quarter of an inch. They are generally considered obsolete except for special purposes. The brown iris and pupil is painted on rather than being a tint. (7.) This is one of the test suits that Rick constructed for Dino while Carlo Rambaldi was working on his mechanical Kong. This test suit was a lot heavier than the final version, which Rick had to wear for about five hours at a time. Rick lost five pounds a day. The test suit was covered

with a synthetic fur, while the final Kong suit was finished in bear hide. (8.) This is a closeup of "Dino" the ape created for *Kentucky Fried Movie*. "Dino" is maybe halfway there, says Rick, in terms of the ultimate ape that he would someday like to create. Readers should look for the upcoming *Incredible Melting Man*, *The Fury*, and *It Lives Again* for more of this talented young artist's work. Later this year Rick hopes to begin work on a new Tarzan movie that is currently in the planning stages. He hopes to be able to team-up with another great of the makeup world, Dick Smith.

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(continued from page 25)

radioactive carbon-14 was added to a soil sample, in the hope that some Martian life form would find it tasty enough to accept it as food and give off carbon dioxide. The experiment indeed produced a surge of this gas. Moreover, the gas was "labeled" with radioactive $^{14}\text{CO}_2$ and therefore originated not from the soil but from the "food." But do not rejoice too soon! Again Dr. Horowitz wields Occam's Razor: There just happened to be certain organic compounds in the nutrient broth, such as formic acid-(HCOOH, formate), which react easily with hydrogen peroxide, producing carbon dioxide and water. Of course, the CO_2 molecule would be labeled with carbon-14 and thus simulate a food digestion process where there never was one.

In the third attempt at finding life, Martian microorganisms were invited to build up organic matter from carbon gases in the air, just as plants on Earth use photosynthesis for assimilation of organics. Something (or some thing?) obliged!

Carbon monoxide and carbon dioxide, both made of traceable carbon-14, were brought in contact with a soil sample under conditions closely duplicating the Martian environment, including sunlight simulated with a xenon arc lamp. Only the temperature was off: it was warmer inside the chamber than outside on the surface.

After five days of incubation, significant amounts of radioactive organics were detected in the sample. Something in the soil had to have formed those carbon molecules. Surprisingly, seven of a total of nine such tests gave positive results. In two of these, however, the soil had been heated before the addition of the radioactive gases to temperatures that should have killed any microorganisms in the Martian soil. The fact that the reaction was still observed in both cases is reason enough for Dr. Horowitz to look for a non-organic explanation. But none is available at present, other than the realization that it would have to be a very strange chemistry indeed. Does it take fewer assumptions to postulate a strange chemistry than a "stranger-than-thou" life? Wouldn't Occam's Razor this time point to life?

After all, there are some very strange life forms living right here on Earth. Years of biological endurance tests in Earth laboratory chambers containing a variety of harsh extraterrestrial conditions have shown the most amazing result: evolution and the continued existence of life are not necessarily tied to the comfortable environmental conditions of Planet Earth.

In terrarium-like low pressure cham-

bers simulating the Mars environment, many forms of *Earth* life have survived. On a dust-dry surface of powder-like sand and lava rock, lichens and fungi, algae and mosses adapted to an atmosphere as thin as the Earth atmosphere at 30 km (18.63 miles) altitude, containing only traces of oxygen and water. They have also adapted to ultraviolet radiation and X-rays searing the surface, to temperatures ranging from arctic cold to 70°F, and to artificial sand storms that turned the environment into a swirling hell of rust-red dust. While higher life forms such as mice and birds could not live in such a world, turtles were also able to survive for six hours, frogs even 25 hours. Spiders, beetles and meal-worms could exist for many weeks, and bacteria actually thrived, multiplying rapidly. Even oats, beans, rye and rice grew in the Martian "farm," but their growth remained stunted and without the ability of reproduction.

Indeed, there are many forms on Earth which exist outside the chemical and physical boundaries formerly thought to be the limits to life.

Living organisms have been discovered in environments without oxygen or water, in rarified air close to pure vacuum as well as under extreme pressures, in concentrated acid, petroleum, jet fuel, and brine, even in radioactive waste water. In temperatures of minus 140° to minus 175°F, microbiologists have discovered 25 strains of bacteria, 20 types of fungi, and 5 kinds of yeast. At the other extreme, there are bacteria and blue-green algae merrily living it up in boiling-hot water of 203°F and some green plants and fungi thriving at 140°. Many life forms live without sunlight, others dine on sulphur, iron or methane as nourishment.

In the Antarctic, fish, crabs, algae and microorganisms have been found under 500 meters (1,640 feet) of ice shelf. Research balloons have discovered microbes drifting in the atmosphere at altitudes of 20 to 30 km. (12.42 to 18.63 miles). The temperatures here are minus 140° to minus 180°, air pressure only 1/20 to 1/100 of the pressure at sea level. In the Himalayas, a spider species finds it comfortable to live permanently at altitudes above 7000 meters (22,960 feet).

From ocean depths of over 10,000 meters (32,800 feet), living there in total darkness and at temperatures close to freezing, small polyps (sea anemones), molluscs, crustaceans, and bacteria have been brought up to the surface by drilling equipment. The tiny, bug-like water bear, a so-called "tardigrade," can stay alive in dehydrated form for 100 years or longer, encapsulated in suspended animation, resembling nothing more than an inert grain of sand. Until it is brought in contact with moisture: then it springs vitally to life,

having conquered time, drought, and temperatures that can cover a span of 650 degrees—from close to absolute zero to plus 210°F.

All these earthly examples, of course, do not prove that there are spiders, beetles, lichens, water bears, and microbes on Mars. But they demonstrate that primitive life does not require the "pleasant" surroundings to which the humans and other higher life forms are accustomed. And they suggest that the Universe may be teeming with extraterrestrial life. So why not Mars—at least in its past when there evidently was lots of water and, as Dr. Carl Sagan of Cornell University points out in *Nature Magazine*, a warmer and denser atmosphere than today? The zoologist Dr. John Vallentyne considers it highly questionable that the boundaries for Earth life are also meaningful on other planets. And Sagan regards it even as "planetary chauvinism" to assume that life elsewhere has to be in some major way like life here on Earth.

What about the findings on Mars?

There are a number of scientists who do not agree that the Viking results support negative conclusions regarding the existence of Martian life. Dr. Robert Jastrow, director of NASA's Goddard Institute for Space Studies, interprets the results, on the face of them, as favorable to life. If all the tests are considered together, he feels, they suggest that life or some process imitating life exists on Mars today.

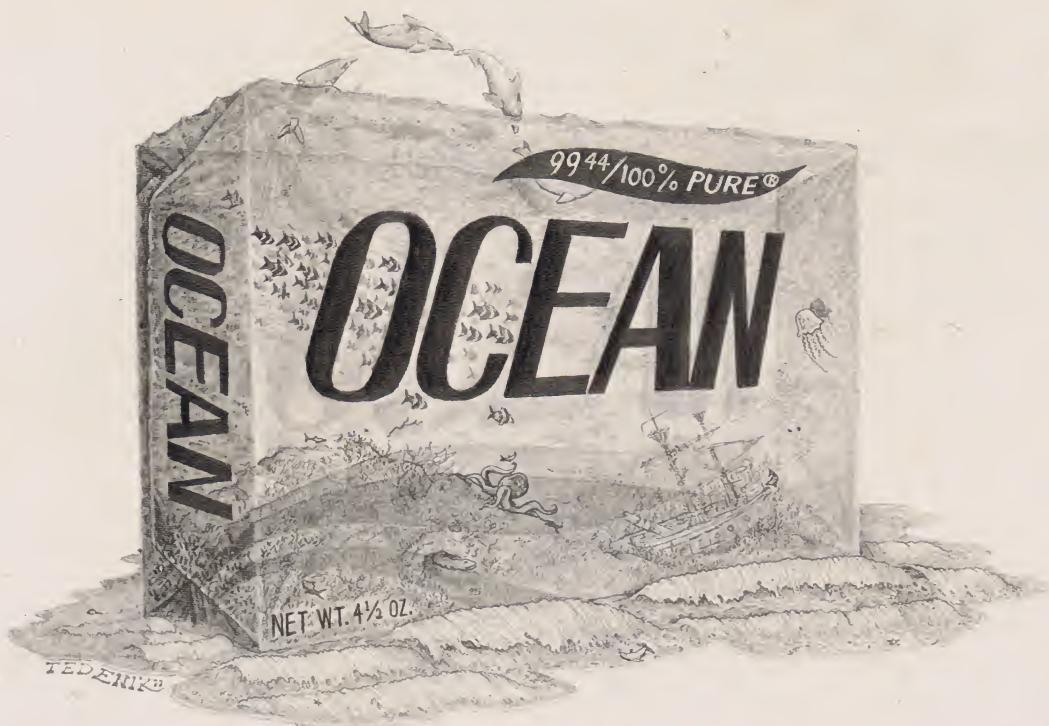
The issue, thus, is not so much the question whether Occam's Razor can be applied to the observed results but whether we are applying it correctly.

What about the basic assumption of a carbon chemistry? While it indeed may be "carbon chauvinism," most astrobiologists today agree that it is the most probable basis for all life in the Universe, due to the fact that this element, among all elements, is unique in the number, variety, complexity and stability (at ordinary temperatures) of the compounds it can form. For living things to replicate and repair themselves, to evolve and adapt, they apparently must be endowed with the highly complex, information-rich proteins and nucleic acids that, based on what we know, only carbon compounds can form.

Even then, the great majority of top scientists in the field today seem to believe that there is life in the Universe, beyond the Earth. The naive view that life is a sole privilege of this lonely island Earth in the immensity of space is no longer tenable on scientific-probabilistic grounds.

But, except for our own existence, there is as yet not a single shred of evidence for this belief. And so, Occam's Razor appears useless.

It is an amazing dilemma for science, isn't it?



Art: Ted Enik

OUR OCEANS: LIFE OR DEATH?

By WILLIAM J. CROMIE

The future of the oceans looks brighter as the result of a 7-year pollution study.

"The oceans are not dying, as the doomsayers claim," reports Robert A. Duce of the University of Rhode Island. He is one of a large group of ocean scientists who have been investigating ocean pollution since 1970 as part of the International Decade of Exploration —a 10-year effort, financed by the National Science Foundation, to predict the health of the oceans in the year 2000.

"We feel more optimistic about the future of the oceans now than we did before the IDOE started," Duce says. "No evidence exists that man's activities have raised levels of pollutants in ocean waters away from coastal areas to a dangerous level."

This directly contradicts statements made by ecologists and explorers such as Jacques Cousteau and Thor Heyerdahl.

"The damage done to the ocean in the last 20 years is somewhere between 30 and 50 percent," according to Cousteau. Although he and his men spend much time at sea, diving and photographing animals, they have done no detailed or systematic analyses of ocean water or marine animals.

Such analyses have been made by chemists and biologists working on IDOE programs. "We have accurate measurements, repeated by different investigators, so we feel confident in saying the oceans away from land are

clean—much cleaner than we thought they would be," explains Herb L. Win-dom of the University of Georgia's Skidaway Institute of Oceanography in Savannah.

Cousteau and Heyerdahl (captain of Kon-Tiki and Ra) warn that oceans around the world are fouled with solidified lumps of oil known as tar balls. IDOE researchers believe these come from wastes pumped overboard by tankers.

"The only problem with tar balls is aesthetic," states David W. Menzel, director of the Skidaway Institute. "The most serious impact they have is when someone steps on them on a beach. Small animals and plants attach to the tar balls and other animals eat these attached organisms. Fish eat the tar balls, and there is no evidence that this hurts them."

"I wanted to collect small animals floating and swimming in the Persian Gulf (between Arabia and Iran)," comments IDOE biologist George D. Grice. "I imagined that the water was terribly polluted by the heavy traffic of supertankers and oil production and drilling platforms. I took 800 nets with me, believing oil would ruin a net each time one was towed. As it turned out, I started sampling with one net and finished days later with the same net."

IDOE scientists estimate that up to four million metric tons of oil are spilled or dumped into the ocean each year. If this oil was spread evenly over

the entire ocean, pessimists warn, it could choke off most of the life in the sea.

"That's impossible," counters Skidaway biologist Richard Lee. "No slick forms a solid covering on the water; microscopic holes allow exchange of oxygen between water and air. Winds and waves immediately break up slicks in the open ocean, and oil is rapidly degraded by bacteria living in the water. The heavy components of petroleum quickly sink to the bottom."

Lee and other IDOE researchers do not completely dismiss the danger of pollution by oil, chemicals, metals and other substances, particularly in coastal waters. In the future, they see legislation and monitoring systems controlling "point sources" of pollution, such as sewage and industrial outfalls, tanker discharges and auto and smokestack emissions that eventually reach the sea.

These laws may not prevent local disasters like the buildup of mercury in Minamata Bay that killed more than 100 Japanese, and blinded and crippled hundreds more. But "there is no danger of an open ocean or worldwide Minamata," insists Menzel. "No mechanism we know of exists to increase pollutants to a level where such a tragedy could occur. If you are worried about the future of the oceans, think of this: if all the dry land and all of its wastes were dumped into the oceans, it would not kill them. The waters and the animals would survive and recover."

*"Here you are," the old man said. "A child
born in outer space . . . And what do they do?
They make fun of you."*

Civilization in Space: *The Possible Dream*

CHAPTER ONE—The Return





There is one strong theme that can be found throughout the recorded history of Man. Whether it is written in hieroglyphics, shown in pictograms, seen in the ruins of ancient structures, or read in biblical texts, the message is the same: Our destiny is inextricably tied up with the stars. We feel this compulsion to extend ourselves beyond an Earthbound existence.

In this continuing series we will be projecting Man's next giant step—the flight from mother Earth and the establishment of an orbital society. Whether or not we live to see the realization of this dream, it is possible and it will be done.

Civilization in Space: The Possible Dream



"... Like a kite that hasn't quite caught up with a gust of wind."

The preceding double-page spread:
A view from inside a cylindrical space habitat, one of the many practical designs considered by experts. It rotates in such a way that it always faces the Sun, solar power collected by the three mirrors and a large disk at one end.

By RICHARD MEYERS

The man knew exactly how the boy felt. Their ages were different. One was twelve years old, the other—well, let's just say he was the remnant of another generation. Their condition was different. The boy's skin was smooth, his hair a dark brown. The man's skin was dark brown and sandy. Not heavily lined with the sagging flesh of age, but tight and coarsened by years face to face with the Sun, unhampered by the Earth's atmosphere until it was "cooked" to the consistency of sandpaper. A condition his partner, or wife in Earthen terms, thought ticklish when kissed; thank heaven.

His hair was grey but smooth and fairly long, circling his face in the form of a beard. Their heights were different, the boy coming to the man's chest. They were even born on different worlds, the man on good old terra firma, the boy on a planet in outer space, a man-made world built by many hands.

But the man knew exactly how the boy felt. It was the way he felt when he first stepped into the floating tube of steel that was to be his home. A huge, humbling emotion. One that combined awe with confusion, pride with doubt, wonder with determination, freedom and a lingering sense of loss.

For the man it first occurred when he stepped inside the space colony. For the boy it happened when he took his first visit to a place he had only heard about or seen from a distance. The planet Earth.

The man moved over and put an arm around the boy's shoulders. The youngster turned toward his elder, smiling wanly for a moment before turning back to contemplate the ground.

"Confused?" the man asked.

The boy grimaced at the foliage by his feet, his forehead screwing up in aggravated thought.

"They laughed at me Geoffry," he finally said. "They called me names."

"Yeah, I know," said Geoffry Merrick with a sigh. "I know."

"I kept falling down. Whenever I walked up a hill. When I walked up stairs. I couldn't play any sports."

"Didn't your parents tell you about the gravity?"

"Yes, they told me that the gravity would be stronger, but I didn't think it would really keep me from doing things. I thought I'd just have to try harder."

The man smiled, thinking about how that was his attitude too at first. So they didn't know exactly what amount of cosmic radiation would permanently damage a human being. So they didn't know for sure how much food they could grow under space conditions. So they weren't sure how prolonged life in space would effect humans psychologically. He would just have to try a little harder, that's all. Like everybody else.

"I couldn't keep up," the boy continued. "I really wanted to, but I couldn't. I tried hard, but everybody would laugh at me."

"Everybody?"

"Well, the parents acted like they understood, but I didn't think they really did. It was in their faces you know, like I was . . . different somehow. They kept talking like I was no different from the other kids, but they all treated me funny. Like I wasn't there or a freak or something."

The man understood all too well.

"Come on," he said. "Let's take a walk."

The boy bounced along the grassy path, happy he could move freely again. It was what he really needed after a short vacation on the mother planet. Geoffry moved after him slowly, letting him shake off the more bitter memories.

The boy ran along a large mound which rose up in the cylindrically shaped habitat. As he neared the rounded top his strides became longer, his steps faster, and he would seem to float across the ground, like a kite that hasn't quite caught up with a gust of wind. He loped down the other side, his strides quickening as he reached the bottom.

Geoffry knew that the boy actually did get close to floating the higher he went. The colonies' rotation to simulate full gravity affected one less the "higher" one went.

"You know," he said aloud, catching up to the boy a little later. "Everybody laughs at a new idea when it first shows up."

"I'm not an idea Geoffry," cried the boy, moving up the side of the mound



"This is a new idea . . ."

again. "I'm a person." The boy was feeling better already.

"Yes, but you represent a new idea."

The boy came running down from the incline, celebrating the feeling of power he felt, pounding at the imagined Earth gravity. He knew that Merrick was going to tell him a story. Whenever he was going to talk about things his voice would get all musical and his right hand would move up, his index finger pointing.

"This is a new idea," Geoffry proclaimed, his left arm sweeping in the long expanse of green grass, grey sparkling brooks, streaky white clouds, rich, dark soil, and little red topped houses, while his right hand pointed up at the two strips of land above their heads, each containing the same grass, water, clouds, soil, and houses.

"No, it's not Geoffry," reprimanded

the boy playfully. "It's been around longer than you have."

Merrick cocked a bright hazel eye at the boy. "Exactly what are you inferring, child? That I'm old?"

"Oh, no, Mr. Merrick," said the boy in mock fear. "You're exactly right. This is a new idea."

"Darn tootin' it is," chuckled the man to the boy's renewed giggling. Merrick sounded just like one of those movie西部片 they ship up for safe keeping.

"Compared to our past history—advances in communication, transportation, genetics, all the research skills, all the sharpening of past knowledge, all the perfections in technology we had to go through before this was possible, it's a new idea alright."

"And everybody laughed at it too. Just like they laughed before Sputnik was

launched, before Glenn made it into orbit and before we walked on the Moon. And you want to know a secret?"

Merrick moved in conspiratorily to the boy's ear.

"A lot of them still don't believe we did it."

The boy laughed, remembering how little Sam Christopher down on Earth wouldn't believe that the boy had come from a space habitat. Not when the boy told him, not when his teacher told him, not when his parents told him, not even when his best friend told him. He just wouldn't believe it.

"Just like a lot of people probably

"L-5, sir."

Merrick looked down at the boy. They were walking side by side, deeper into the colonies' park, covered by the shade of imported trees. The boy's face was clearer, all the lines of confusion replaced by sly mischief.

"Oh, yes, L-5, the distance of 386,000 kilometers from both the Moon and the Earth, where we are now. Everybody seems to laugh at things before they know about them. Then when it happens and they know about it, they forget they ever scoffed and take it for granted."

"Like us?"

plans and concepts and schemes and designs and reports, and they all said the same thing. That in the late seventies we had the materials, the technology, the ability and the need to put 10,000 in space to live and work."

Merrick stopped by a small river which ran quickly along its way, winding up the side of the enclosure until anyone other than a spaceman would swear it should topple back on itself like a waterfall. But it kept flowing, coursing up at a forty-five degree angle. The boy plopped down on a nearby rock as Geoffry delivered the punchline.

"There's only one thing we didn't have. The inclination. I mean, people are people right?" he said expansively. "Here you are, a child born in outer space. A boy existing in a totally different and wonder-filled environment, with overwhelming potential and capabilities. And what do they do? They make fun of you." The boy looked about ready to burst with some inner information.

"Now what did you want to say?" Merrick asked.

"That isn't the way it happened!"

"I know that," Merrick answered. "So who needs 10,000 people in space by 1990? How will that help the population explosion? And how much will solar power satellites cost? Two, three hundred billion dollars all together?"

"Excuse me," said the boy.

"Just a minute. Like I said, people are people and the estimate grew and grew. At one time prominent scientists actually said that they could put a man on the Moon with the help of twelve orbiting ships servicing a space station where three huge ships would be made, all at a cost under five billion dollars."

"Uh. Pardon me . . ."

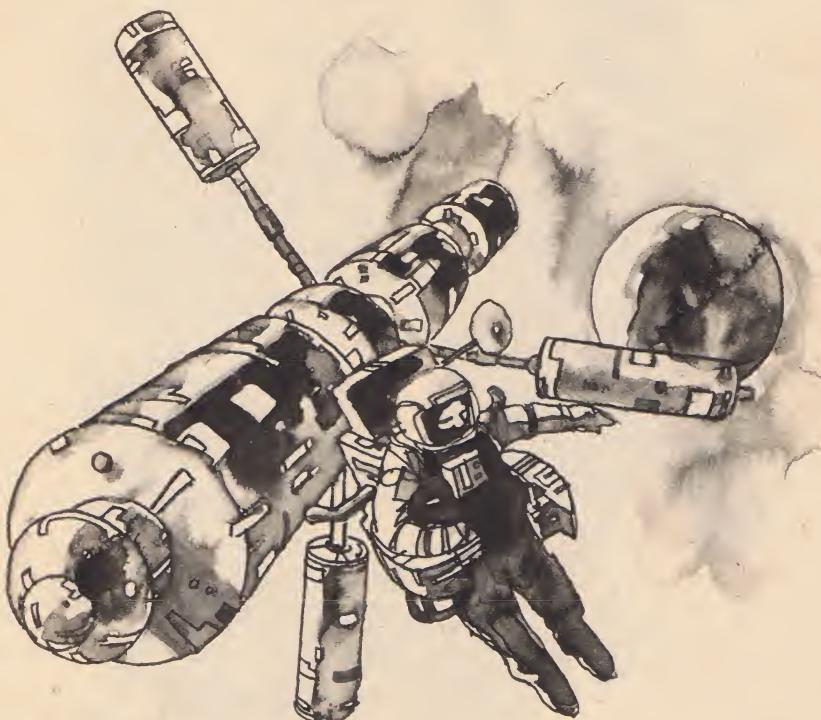
"Let me finish this one thought. Still, in the long run, it cost forty-five billion dollars to get sixteen guys to stumble around and play golf on the lunar surface. Now when you think about the economy in the late seventies and the idea that the lunar landing project cost more than eight times its projected amount, you're talking about a space colony that could cost more than sixteen hundred billion dollars! Of course, it didn't cost that much in the long run, but at that time it was a lot of cheese to swallow in one gulp."

"Mr. Merrick?" The boy had his hand raised with a diligent expression on his face.

"Yes?"

"What's dollars?"

Merrick had done it again. Whenever he talked to the new generation of colonists, especially the younger ones, he had a tendency to get carried away. Of course the boy wouldn't know about dollars, not having to deal with planetary trade. He knew only about the tokens, the small disks individually metered out to each colonist. Only those



"It was a bunch of little tubes off of a bigger tube . . ."

didn't believe Lagrange back in the eighteenth century when he said that an asteroid travelling at a point equal to both the Earth and the Moon would be gravitationally trapped."

"Yes, sir!" snapped the boy. "That was Joseph Louis Lagrange, a French-Italian mathematician and astronomer. Everybody knows that."

"Who's tellin' this story anyway?" Merrick exclaimed. "You or me?"

"You are, Sir."

"I mean if you want to talk it's alright by me. I'll just go on my way. I've got things to do. Pressure to be checked, atmosphere content to be checked, speed of rotation . . ."

"No, really. I'll be quiet. Go ahead Geoffry."

"Thank you very much. Now where was I?"

"Like us. Back in the late twentieth century people said we could put 10,000 people in space by 1990."

"But . . ."

"Now don't interrupt. They had it all figured out. First they'd use a space shuttle and set up a laboratory in low Earth orbit for testing the effects of space on people and things. Then they'd ship a bunch of people to the Moon to mine the necessary materials to build a space colony here so 10,000 people could be sent up and sent to work building satellite solar power stations to provide energy for Earth."

"But . . ."

"Now I asked you before, who's tellin' this story?"

The boy swallowed his interruption with a lopsided grin.

"Good. Well, they had all sorts of

dealing with Earth still worked with dollars and cents.

"It's like your token, but for Earth," he explained. "They print their income on lots of pieces of paper and different size pieces of metal."

"Paper and metal?" said the boy incredulously. "Isn't that an awful waste?"

"Exactly," smiled Geoffry, kneeling down next to the boy. "It is a waste. It wastes trees and precious mineral ore, but it is what Earth's economy is represented by, so the waste continues. And as long as it seems there's enough metal to go around, it will continue."

"Just like they continued polluting the air and ocean with factory wastes and auto exhaust. Cars were for travel; industry made the country strong. Try to change that and you were threatening the entire system."

The boy looked up through the trees, out between the two strips of land. He looked past the massive slice of mirror reflecting the sun's rays into the habitat, making the plants grow, the rivers and lakes sparkle, and the inhabitants tanned and healthy.

He looked out into space, across the thousands of miles where Earth hung, like a ball of turquoise against a gem studded sea of velvet.

"It looks very peaceful," said the boy. "Not self-destructive at all."

"Absolutely," said Merrick. "Steps had to be taken to insure it stayed peaceful. The rewards of space were very inviting but the price tag was not. Especially since we really did not know enough about the way things work up here. So industrialization started."

The boy made a face of great concentration.

"Uh . . . businesses began to take advantage of the benefits of space," Merrick explained. The boy's face cleared again, though Merrick wasn't sure he actually understood, so he went on.

"Small, individual laboratories and offices were shipped into orbit where metals could be produced easily, communication systems could be designed and implemented with greater clarity, weather could be studied and forecast with greater accuracy, and many other studies and experiments could be tried. In the long run it was cheaper to ship up a team of scientists than to try to deal with atmospheric problems on Earth.

"Not surprisingly business took the first step. The only way politicians were going to do anything was if some competition could be fostered, like the space race of the sixties. And in the seventies and eighties too much time was spent building up armaments and loosening international tension to consider 'racing' anyone to complete the first space colony.

"So while they investigated energy from the sea, energy from the Earth, and energy from the core of the atom—

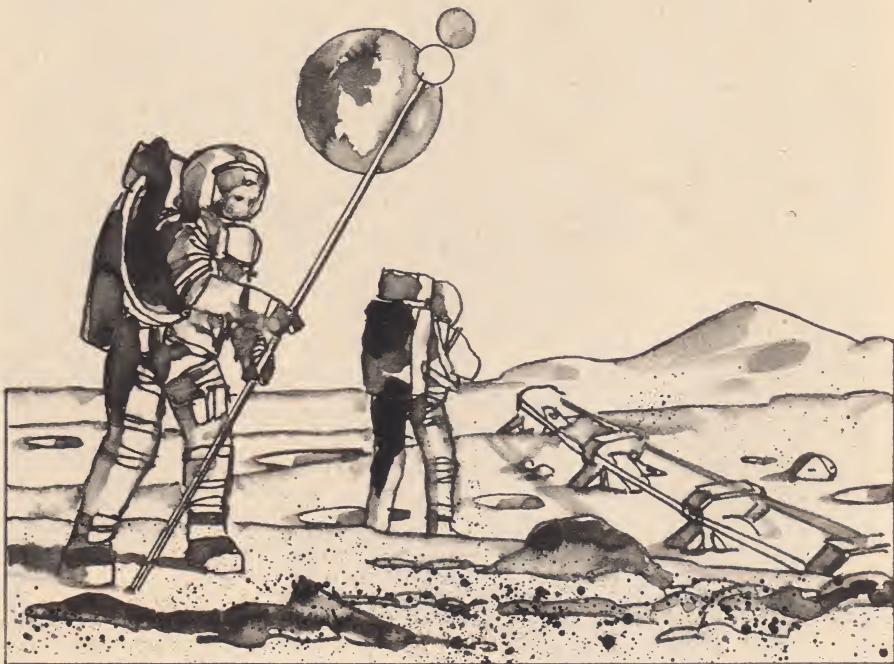
nuclear energy—more and more industrial scientists went up on the space shuttle and spacelab and spent more and more time in space. When more transport vehicles were built, they sometimes stayed for as long as three years."

The boy thought of his father. He thought of the tall, lightly muscled man with the dark brown eyes and thinning hair, smiling at him, listening to him, teaching him to space glide and play bodiball. He thought about three years without him . . .

"Didn't it . . . well . . . I mean . . . get . . . you know . . . kind of . . . lonely for them?"

"Productivity?"
"The work wasn't up to snuff."
"Oh."

"So new habitats were designed and programs to send families into space began to take shape. Of course it wasn't that simple. You don't open a space-lock and tell a family, 'This is outer space, live in it for a year or two and see how it works.' A lot of time was spent analyzing and eliminating problems. Shields were developed to prevent radioactive poisoning, the effects of zero gravity on the bones and organs was considered and many other things were taken into account. But most of



"We mined the Moon . . ."

Merrick smiled, both at the boy's intelligence and his 3D-TV vocabulary.

"Absolutely, and you could say that cosmic loneliness started it all. Naturally the longer people stayed in space the more we learned about it. And the more money we saved. And the more money we saved the more money we poured into discovering more. We started to perfect all those things we needed to perfect to guarantee the comfort and safety of those 10,000 back in 1990.

"But the ones and twos and threes were feeling low. Many loved the challenges space had to offer but two years staring into the unshaven face of another astronaut was hardly an enticing prospect. Nor was several months of food in sacks and showers consisting of a sponge and an empty tank. Productivity began to suffer."

them had been solved before the first real space colony was built for three families."

"I know, I know!" the boy cried excitedly. "We learned about this already. The Rogers, the O'Neils, and the Hudsons."

"Right," said Merrick. "And what was the ship like?"

"It was a bunch of little tubes off a bigger tube. There was a lab and a kitchen and an eating area, a play area, and . . . uh . . . let me think for a second . . . six bunks and . . . uh . . ."

"A private area."

"Yeah, yeah. A private area."

"That one little room, the only one with a port in it, was the first real step toward actual space colonization. The three different families had to reserve it in advance. It was where they went off

to be alone, with themselves or together."

"Together, huh?" the boy sniggered. Some things never changed.

"We'll talk about it more when we both get older," promised Merrick.

"The first space baby was born after that," said the boy.

"That's right," said Merrick, turning a quizzicle eye on the waif beside him. "Maybe we should have that talk a little sooner than I expected."

"Yes, the baby was born. Thomas David Rogers, the first child conceived in outer space. To the great disappointment of the media he wasn't two-headed

locale of their creation, they were treated the same as if they were born in Paterson, New Jersey."

"Then things began to change, didn't they?" the boy asked glumly. "My . . . my family environment."

The boy's face darkened with the memory of his first Earth visit again. Or maybe it was because the long mirrors positioned outside this colony had begun to shut, bringing on the habitat's night.

"Come on," said Merrick. "We had better start getting back."

He put his arm around the boy's shoulders and the two left the riverside,

the back. He had lived it. He had known both worlds intimately. He had helped to make the decision to band the many individuals into one habitat. He had sat with the executives and the technicians, planning every aspect of Sis new beginning. He was one of the first to go up with his family to prepare the way for others.

After so many years the Earth was comfortable with outer space. They were aware and ready for its dangers. They were capable of creating a new and, possibly, better life among the stars. At least they could control it from the very beginning.

"We had begun to mine the Moon the way the seventies scientists said we would. As a matter of fact we followed their original plan almost exactly. They had created it to be the most logical, intelligent, and practical method of seeding the stars, and once the great number of unknowns were alleviated, it proved to be just so."

"Alleviated?" queried the boy.

"What?"

"What does it mean?"

"Oh. Corrected."

"Thank you."

"You're welcome. We mined the Moon, yes," Merrick remembered. "Gathering the raw materials to, not only create the colony, but supply Earth with minerals to keep making those coins. Then, once the first station was finished and inhabited, our promise was kept to our ancestors. Solar power satellites were manufactured to supply clean energy. No more threats of nuclear meltdowns. Little chance of human greed or sloth causing mass plutonium contamination."

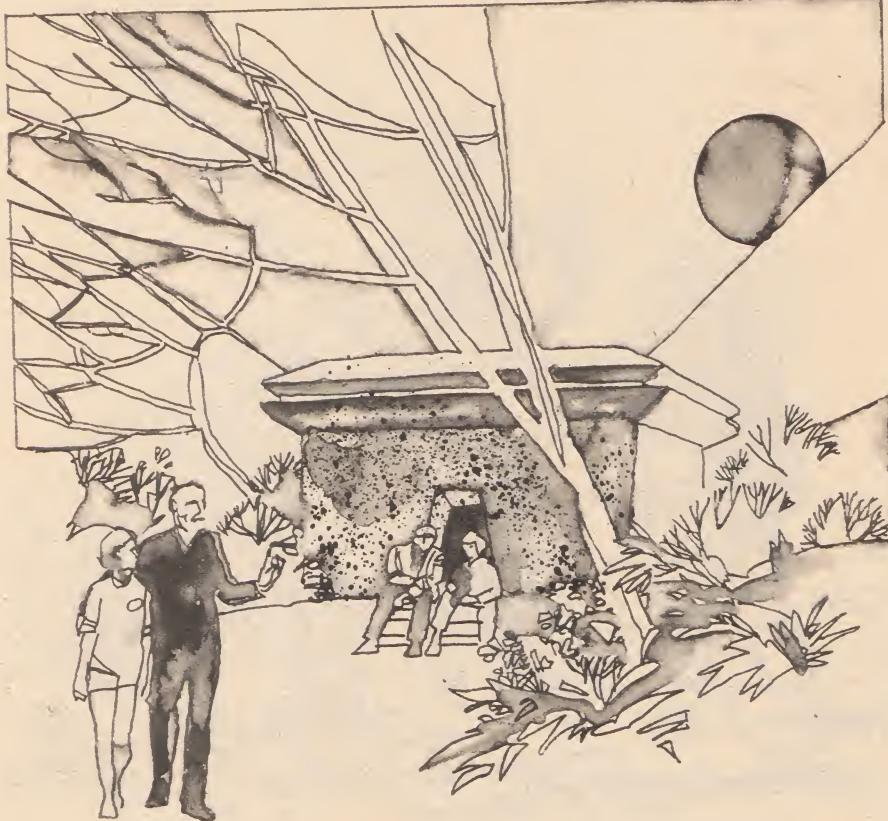
The two made their way through the brush to a group of trees that led to a clearing. The mirrors were almost completely closed now, pushing a bright orange-blue dusk across the land. Through a system of evergreens, hazy lights flashed on, winking as the two shifted position.

Geoffry was aware of the boy at his side, listening raptly as they moved. But he spoke to more than him. He spoke for more than himself. He was speaking from his entire experience to the possible worlds beyond.

"There was a lot of excitement in those first days," he said. "Things had gotten to the point where we had to succeed. All eyes were on us, expectant, hopeful, charged with an almost fanatical fever. Not like the apathetic days of the seventies. These people saw us as the last chance."

"The President instituted a program for far reaching effects on the development of intelligence and fitness for all citizens. So all citizens could be part of, what he called, 'man's ultimate manifest destiny.' And for once Congress didn't oppose him."

"And we didn't fail. I'd like to say



"They were moving through the trees to the warm, inviting bunkhouse . . ."

or green with tentacles. And to the parents' great disappointment he grew up normal in every respect. No sudden cure for the common cold, no otherworldly knowledge, no advanced intelligence.

"He ate, walked, slept, played, got sick, and talked back just like any other child. Well, almost. His reputation as the first seemed to precede him wherever he went to the point that he got increasingly hostile the older he got. If he acted normally people would wonder why he wasn't strange and if he acted strange no one would leave him alone.

"Thankfully, that problem cleared up as more of these family shacks went up. More children were conceived and born. As soon as everyone understood that it was their family environment that dictated their growth habits and not the

following its path back into the open park area.

"Yes, things changed. But for the better on the most part. Like the American frontier, more and more small bands of people made their way into space, most of them profitably, some tragically. Humankind is beautiful but not perfect. Fail-safe machinery sometimes shuts down. Sometimes charts are misread. Sometimes a solar flare would be mistimed."

"We began to mine the Moon," the boy prompted, not wanting to know the particular disasters.

"Hey, you know this story," the old man laughed, shaking the boy's shoulder.

"No, no, really. Go ahead. I don't know it the way you know it."

Merrick nodded, patting the boy on

that the thought of failure never entered our heads, but it did. Like you on Earth we had a lot of stairs to climb. And we tried harder. If we couldn't make it we tried even harder. And if we still couldn't make it, we tried harder than we thought we did. We wouldn't stop, we couldn't stop. We just kept climbing and trying."

"Did we make it?" asked the boy.

"I don't know. Did we?"

They were moving through the trees now toward a warm, inviting bunkhouse made of moonstone. It was the only one like on this part of the colony, each strip had one to serve as a their park's headquarters, a truly unique landmark.

The boy's parents were sitting on the steps outside, talking animatedly. The boy stopped before coming out in the clearing and faced Geoffry.

"I didn't give up either," he said. "I got tired, but I always made it. Up the stairs I mean."

"I know you did," Geoffry smiled. "And here we are. Those kids back on Earth didn't realize how tremendous it was for you just to get to the top of those stairs. They made fun of you instead. And you want to know why?"

Merrick kneeled down to look directly in the boy's eyes and, with him, it wasn't a patronizing gesture.

"Because they're jealous of you, that's why. You're different from them. You were born here. You've experienced things they can only dream about. Down there you're just a boy. But up here, at home, you can fly."

The boy smiled, remembering the hills of zero g, where his father worked, near where he lived.

"That's right!" he said. "That's right. They can't fly."

Geoffry Merrick stood up and walked with the boy back to his parents.

"You know what?" said the boy along the way.

"What?" asked Geoffry.

"This is a secret. I haven't told anybody because I bet they'd think I was afraid of the dark, but, when night comes and you close the mirrors I miss the stars. I wish you didn't have to do that."

Then he ran to his father. The two met halfway in the dusty clearing, the father swinging the boy around by his shoulders, the younger laughing with glee as his feet kicked up a golden cloud. The mother walked over to Merrick, smiling, her hands out. Geoffry took them, planting a kiss on her cheek.

"He hasn't been a bother, has he?" she asked.

"When has he ever been a bother?" he responded. "Good trip?"

"Fair. He kept complaining of headaches. And the kids making fun of him, of course."

The father and son approached, the elder's arm across the boy's shoulder,

the lad's around his parent's waist.

"Geoffry, thanks for looking after this fellow," exclaimed the father. "I haven't seen him this excited in weeks."

"Oh, I think that must be more the bodiball and space gliding trials coming up soon than my company," Merrick suggested. "I hear the lad's become an ace of the skies."

"You'll come?" the boy asked anxiously. "To the trials? To see me?"

"Of course," said Geoffry.

"Thanks again," said the father. "See you soon." They shook hands.

"Geoffry," said the mother, turning to go after taking his hands again.

prolonged exercise in Earth grav might not counteract the effect. One thing for sure, the boy wouldn't be making many more trips to Terra.

Even though the lad didn't have to or want to, Geoffry would have to talk to the boy's parents about moving a little further down the strip, closer to the center, and starting a new regimen of workouts for the whole family.

But he knew whatever happened the boy would keep trying. Because he was a child of the stars and knew how to fly.

Geoffry Merrick went inside the moonstone h.q. to see if there was any tea left.



"When night comes and they close the mirrors, I miss the stars . . ."

"See you Geoffry!" cried the boy, spinning around to wave before moving between his parents.

Geoffry watched them go in the light of the colony night, generated by solar energy collected during the day by the scoop at the bottom of the colony, lined with the new power cells. He knew that the doctor had told him that the boy's muscles and bones were going soft from living too close to zero g levels. Even

**NEXT
ISSUE:**

**Chapter 2—
"The Cola Wars"**

sf.graphics

Editor's Note: Each issue FUTURE will examine the world of advertising and promotional graphics. The invisible talents who sell science fiction to the public also add reality and excitement to imaginative visions that do not yet exist. Their fantastic work, too long overlooked and uncredited, will find a proper showcase in this regular feature.



Two different posters for theatrical display, designed and executed by artist Tom Jung. Above: All of the key elements of the movie are included in this one, but it seems to focus on the X-Wing fighters. Below: This variation zeroes in on main characters and the evil countenance of Lord Vader.



Above: An early newspaper ad for the film included no graphics. Right: The Hildebrandt brothers poster now on sale.

By SCOT HOLTON

The phenomenal success of *Star Wars*, while not dependent upon its advertising campaign, has been greatly enhanced by its various posters, newspaper and magazine advertising displays.

The history of the development of the ad art campaign was related to FUTURE in an exclusive interview with 20th Century-Fox Advertising Vice-President, David Weitzner, and Advertising Director, Tim Deegan.

Weitzner joined the project in February of 1977. At that time, two teaser posters had already been developed by the advertising agency of Doyle, Dane, and Burnbach and approved by George Lucas and Fox President Alan Ladd, Jr. The first of these was a 27" x 41" black-on-foil poster reading, "Coming to Your Galaxy This Summer," and the second simply reading, "A Long Time Ago In A Galaxy Far Away," above the *Star Wars* logo.

Weitzner began working on the advertising campaign immediately and developed a series of approaches. Working through the ad agency of Smolin, Smith, and Connelly, who employed Tom Jung, they developed the poster art which ultimately became the film's 22 x 28 theatrical display poster and the 27 x 41 1-sheet display poster. The 22 x 28 became the first advertisement with artwork that appeared May 15th in the U.S. newspaper advertising campaign. The second of the newspaper ads to appear used the 27x41 poster format and was first seen May 22nd. This poster is also referred to as the "Buck rogers" by Fox studio personnel because of the stylization of its design. The art work was conceived to serve for both the newspaper advertising and for theatrical display.

The next look to appear was developed when Lucas expressed a desire for



STAR WARS

FACTORS ETC INC., BEAR, DEL. U.S.A. IMAGE FACTORY INC., HOLLYWOOD, CALIF.

1977 TWENTIETH CENTURY FOX FILM CORP.

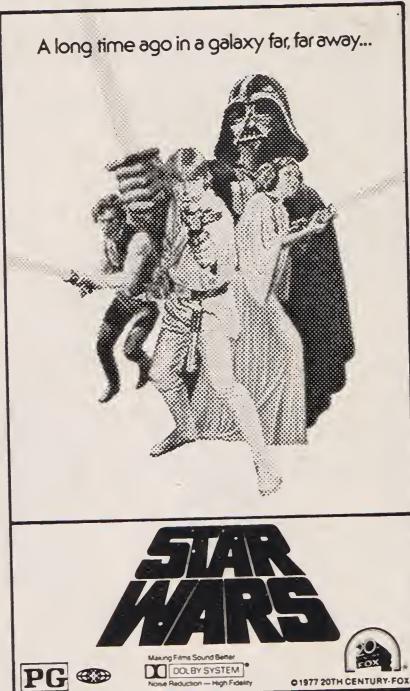


STAR WARS

Below: British newspaper display ad by artist Tom Chantrell. As of January 1, it replaced the Jung and Hildebrandt designs in the American advertising campaign.



Above: Poster executed by illustrator Ron Larsen. It was done as a promotional item for the soundtrack album. It never got the attention that some of the others did.



Left: The original logo, created by pre-production artist Ralph McQuarrie. When the Star Wars Corporation was born, they chose McQuarrie's graphic—tied together with the movie title—as their corporate logo.

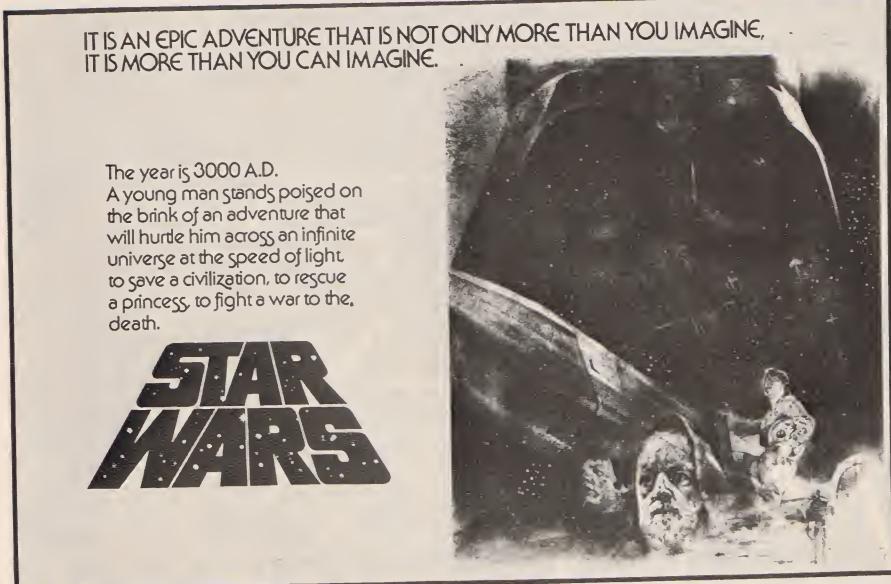
Below: The famous "holiday greetings" poster put together by Tony Sinegar. It appeared in newspapers all across the country during the Christmas weekend.



a more fanciful, period-type rendering. Going back to Smollen, Smith, etc., Lucas commissioned the now-in-use 1-sheet poster design by Tim and Gregg Hildebrandt that was ultimately approved for licensing by Star Wars Corp., and is commercially sold as a souvenir poster.

Since then two additional pieces of art have been commissioned. The first was used in a December 23rd, 1977, newspaper advertising campaign and it used photographic images of the film's major characters with signed Christmas greetings. It was designed by Tony Sinegar for the Doyle Dane Agency in London. The second will be used for the United Kingdom advertising campaign, and was created by Tom Chantrell for the same agency.

Beyond the poster art specifically created for the theatrical promotion of the motion picture, two additional pieces of poster art exist that were made in conjunction with the release of the soundtrack album. Of these, the first is the album promotional poster for record store displays created by Ron Larsen, and the second, which is used as an insert in the album, was designed by John Berkey for the advertising firm of Frank and Jeff Lavary in New York. ■



Above: You've never seen this one before. Another Tom Jung poster, it represents an early stage in the development of the theatrical display posters pictured on page 48. Note that 20th Century-Fox had originally placed the space fantasy's action in the far-flung future—the year 3000 A.D., to be exact.

in a global crisis and there must be global solutions.

Old and foolish enmities cannot continue, therefore; war-machines cannot be used, or even maintained. It is suicide to fight, to prepare to fight, or even to think of fighting. Like it or not, we must all cooperate if we are to escape the precipice.

Population can be controlled; education can be reorganized; space can be penetrated and exploited; energy sources can be used—but only through a world-wide cooperative effort.

In short, the society of the future will be free of war and of racism and, in fact, will see the establishment of some form of world government—if we are to survive.

Of course, we needn't suppose that our civilization *must* survive. If human beings would rather have all the children they want, and if they would rather maintain large and elaborate war-machines than develop a new education and devise ways of penetrating space, then they can.

But in that case, civilization *won't* survive and, over the next generation or so, billions will die. □

input

(continued from page 5)

decide to credit the children with intelligence, the show could be good." I just saw an episode of *Wonder Woman* which ripped-off some stock footage from *This Island Earth*, had extraterrestrials which spoke an "Artoo" kind of language and a "monster" that resembled Darth Vader. The whole show was a total bore. Amazing how little imagination some people have.

Francois Beaulieu
Montreal, Canada

Science fiction on TV has been taking its lumps of late, in more ways than one. FUTURE will be reporting regularly on what's occurring, both good and bad, in the network realm via our Video Images section.

A WIDESCREEN DUNE

... Is Frank Herbert's *Dune* being made into a motion picture? I would be deeply satisfied (as would a great many other Herbert readers) if some information on the movie was printed.

Bill Daly
Braintree, Ma.

*Sad to say, as of now, there are no plans to bring *Dune* to the screen. A project was planned a few years ago to be directed in Europe by Alejandro (El Topo) Jodorowsky, but grinded to a halt due to lack of funds. Spacey rock stars, Pink Floyd, were contracted to compose the musical score for the ill-fated film.* □

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- C-7 "What Are Little Girls Made Of?"
- C-8 "The Doomsday Machine"
- C-9 "Journey to Babel"
- C-10 "The Menagerie"
- C-11 "Where No Man Has Gone Before"
- C-12 "All Our Yesterdays"
- C-13 "Mirror, Mirror" (pictured above)

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Future Forum is designed to expose our readers to the thoughts of a variety of experts in the fields of science fact and science fiction. Each issue will pose a new question to our "guest panel" on a particular aspect of SF, space-age technology or future trends. This issue's question:

What does the future hold for science fiction?



Norman Spinrad: Author of *Bug Jack Barron* and *The Iron Dream*

I think that SF has gone bigtime. Right now it's the hottest thing in film but probably won't continue at the same level indefinitely. As far as commercial novels go it's on the way to establishing itself as a major commercial category. Whether science fiction can maintain its serious level and quality while it sells more books is a question that is yet unanswered. But science fiction has broken out in the public and marketing sense. It is already the sole repository of the short story. There are very few outlets for serious or non-erotic short stories except science fiction. Right now SF is trendy but, unlike most trends, this one is based on something deeper than marketing psychology and the kind of manic-panic on the part of people who think they have a hot new thing. There's more substance behind what's happening. The interesting thing is, it's not happening the way people thought it would happen. Instead of SF breaking out of the category and selling to a broader audience that doesn't have anything to do with science fiction, people are suddenly realizing that there are four, five and six million people in this country who read science fiction. And if you get to each of them or half of them or a tenth of them . . . you have a best seller, or a top box office movie. I don't think this SF boom is like the boom of

the fifties at all. That was a case of, oh, Sputnik. And a great many magazines (were) designed to cash in on it. Now, they're learning that the audience always existed and nobody has really gone after them in a major league way. They're learning now.



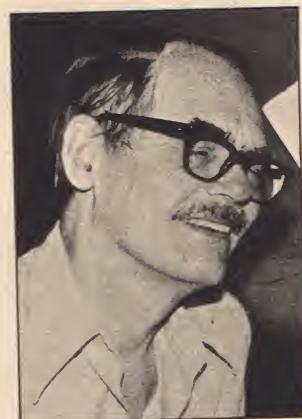
George Pal: Producer of *The War Of The Worlds*, *Destination Moon*, *When Worlds Collide* and *The Time Machine*

In terms of motion pictures, I think that science fiction has a brilliant future. Science fiction has always been alive in film, it has always been there. But the motion picture industry has neglected it. Now, perhaps they will take notice of it because of today's success. Science fiction has always been fascinating in film, going back to *A Trip To The Moon* (1902). There has always been good SF in the movies: *Things To Come*, *Metropolis*, *The Invisible Man* and some of my own films. Now, finally, two studios, Twentieth Century-Fox (*Star Wars*) and Columbia (*CE3K*) have had the courage to make science fiction important and meaningful to the industry once again. I hope that they continue to make important science-fiction motion pictures. And I hope they continue to make them "good."



Gene Roddenberry: Producer and creator of *Star Trek*

I think that science fiction has become a legitimate branch of literature. The future will find it more popular than ever. It will no longer be relegated to the now and then "space opera" category. And science fiction isn't just "happening" in film. It's happening in books and, hopefully, it will happen in television. People are beginning to accept science fiction. It's no longer considered a lesser form of literature. In its own way, it stands as a finer form.



Frederik Pohl: Hugo award winning editor, and author of *Gateway*, *Man Plus* and *The Space Merchants*

I think that science fiction is the future. It's a literature of change. It talks about all the possible futures that may exist in one story or another. It will continue to do that indefinitely. As we discover new scientific concepts, SF writers will discover new ways in which they affect human beings.

Photo : David Hutchison



Michael Kaluta: SF
illustrator—*The Shadow*, *The
Swamp Thing*.

In the future, there will be a lot more movies, a lot more notoriety. Old-time, established authors will have their books made into films. Young, up-and-coming authors will have their books made into films and become famous, some probably undeservedly. There will be a lot more work in the genre. People who have been published before but possibly not in science fiction might shift over and try their hand at it. So you might get something really strange, like John D. MacDonald's *Ballroom In The Skies*.



Forrest J. Ackerman:
Author, editor, literary agent, Hugo
Award winning science fiction fan,
editor of *Famous Monsters of Filmland*.

The next twenty years in science fiction? Let's round it off to twenty-two and look back from the year 2000. I think the biggest advance will be in the visual media. By the 21st century every kid will have a "wall-a-vision" in his den and a collection of classics including such video mini-series and theatrical spectaculairs as *Darth Vader Lives*, *Close Encounters Of The Final Kind*, *Slan*, *The World Below*, *The Martian Chronicles*, *The Grey Lensman* series, *Childhood's End*, etc. Twenty-five thousand more novels and anthologies will have been published; it will require whole wings of libraries to accomodate all the posters. A complete set of 365 issues of *Famous Monsters Of Filmland* will be worth one million dollars and an 84-year-old FJA will still be in the thick of the scienti-frey.



Bob Mandell: Director of
Creative Services for ITC Entertain-
ment (*Space: 1999*, *UFO*, *Thun-
derbirds*)

There will certainly be a lot more science fiction, that's for sure. What it means to people in the industry who produce it and people who actually watch it on TV or in theaters is different. But one thing everyone connected with SF shares is a feeling of *future shock*. That common theme of someday actually having in your possession something you've always dreamed of having or doing or seeing. I guess that's one of the reasons it's so appealing—the whole science-fiction genre. Also, when you work in a medium like science fiction, it makes you think about how much you don't really know. You see a picture with amazing special effects and you think "that could be real." But you really don't know. And the next day you're at your desk, the nine-to-five kind of thing, and you say, "Well, I really don't know as much as I thought I did yesterday. I'd better reevaluate what I'm doing now." Seeing a movie like *Star Wars* or *CE3K* gives me a little more energy, maybe a little more motivation to look at my own work through different eyes. The best part of science fiction for me is that it covers so much ground, so much territory. That's the beauty of science fiction. Anything goes as long as it's well done.



Ben Bova: Author, and editor
of *Analog Magazine*

How high is up?



David Prowse: Actor, and
portrayer of both *Star Wars'* Darth
Vader and the Frankenstein mon-
ster.

Every so often something happens to send the cinema off on a different tact. *Star Wars* is now doing that. We're now into science fiction. People like myself are sick and tired of looking through the newspapers, then going to the cinema and not seeing things they consider suitable to see. There are too many sex films, too many horror films and too much violence in the cinema. *Star Wars* has filled a fantastic void. We're really talking about *science-fantasy*. Basil Rathbone and Errol Flynn all over again, but in a futuristic world. Really, it's fantastic. There'll be a great interest in science fiction for quite a while provided that the films are done well. As soon as you start cheapening the product, the cinema will go off on a different tact again.



Art: Marie Severin

Archie Goodwin: Editor-In-
Chief, Marvel Comics.

Science fiction will be getting more and more popular because I think everyone is becoming more and more concerned about the future. I think we've finally reached a time when, with the current concern about ecology and everything else, people are realizing that what lies down the road thirty, forty or fifty years from now will really determine the course of the human race . . . or if there will be a human race. I think this is gradually seeping through everyone's consciousness and I believe science fiction will become bigger and bigger because of it. Even as escapist reading, SF will become more and more popular because of the every day grimness of the world that is upon us now. Science fiction will offer a look at a different and much more hopeful future.

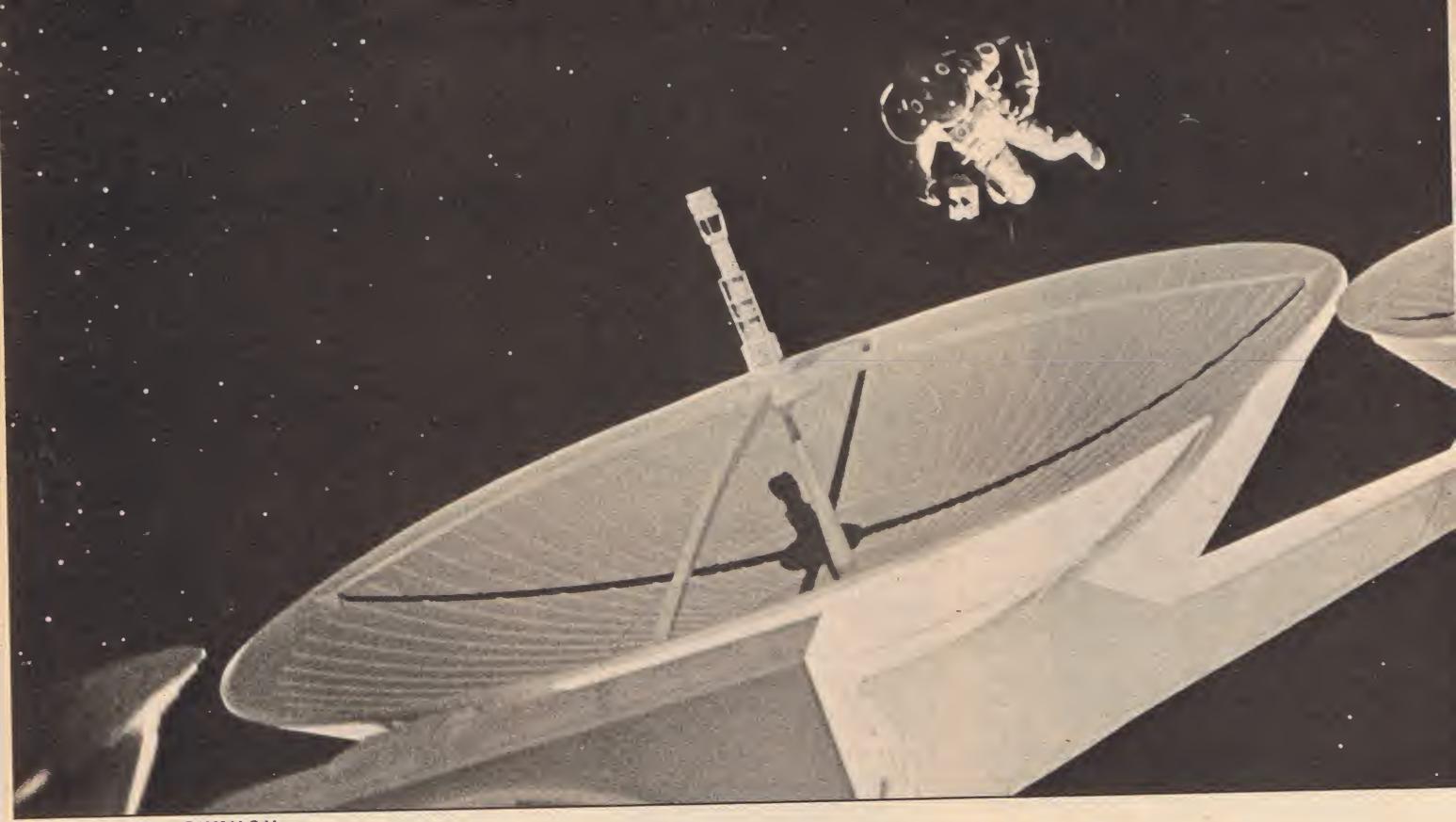


Photo: © 1968 M.G.M.

The Incredible Effects World of Douglas Trumbull . . . And Now—SUPER 70

Doug Trumbull, the *wunderkind*, who at the age of 23 created the brilliant photographic techniques for *2001*, who directed his own *Silent Running* and supplied exciting visual effects for *The Andromeda Strain* and *Close Encounters of the Third Kind* is a frustrated man.

By DAVID HUTCHISON

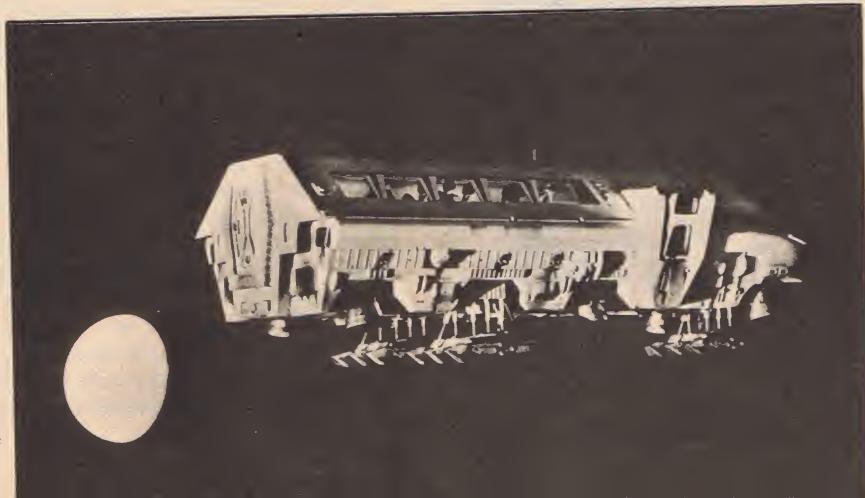


Photo: © 1968 M.G.M.

I am frustrated with the way motion pictures are made and presented," says Doug Trumbull. "So I've been sort of hiding out for the past few years, making some breakthroughs that I think are going to be received with great enthusiasm." The breakthroughs have come as a result of basic research he has been doing at his company, Future General, which is allied with Paramount Pictures.

"Except for Cinerama," says Doug,



Above and below left: *2001* created a standard for SF and fantasy technique that has taken almost ten years to match and surpass.



At left and below:
The extraordinary robot drones from *Silent Running*, were superbly played by four young bilateral amputees, who managed the cumbersome cases skillfully and enjoyed the experience immensely. Today, "drone 2" graces Doug Trumbull's office at Future General.
Photo: © 1972 Universal



"no one has ever created a new film process that was clearly and distinctly separate from the rest. And therefore worth the special effort. Is four-track magnetic better than an optical track? Is 70mm better than 35mm? Does it show up in the boxoffice? Is it going to make or break people's decision to come to the theater? Ordinarily, it doesn't. And the producers know that, so they don't feel economically justified to go to the trouble.

"A big problem that occurred in the movie industry in the past was that the exhibitor has been isolated from the movie-maker by the anti-trust laws, which really crippled the whole possibility for the motion picture industry to move ahead in terms of new processes, wider screens, different kinds of sound systems, and all kinds of really dramatic improvements in the medium itself."

However, at Future General, Doug has been working on a film and a new technique. The film is called *Brainstorm*

Below left: James Shourt and Douglas Trumbull are shown designing possible configurations of truncated tetrahedrons that appeared via computer animation in *The Andromeda Strain*. The sequences were rear-projected onto process screens during the filming of the scene shown in the underground laboratory below.



Photo: ©1971 Universal
Photo: ©1968 M.G.M.



Photo: Courtesy American Cinematographer

and the process is called Super 70. About *Brainstorm*, Mr. Trumbull will only say that it is about the frontiers of the human mind and that a portion of it will be shot in January as a test. About Super 70: "It's going to be the ultimate experience—the highest conceivable quality."

At Future General Doug has a five minute test reel and demonstration theater set up. The reactions of those who have seen it are usually amazement and wonder. Steven Spielberg commented "... it's really remarkable. It's like looking through window glass—that's how clear the film is. You ex-

pect a breeze to come through the screen and blow your hair. It's the most amazing thing I have ever seen—even though, technically, I'm very conscious about these things. It's more than just a film; it's a very sensual experience."

Super 70 is a 70mm film process. A *high speed* film process with the camera running at 60 frames per second, the projector running at 60 frames per second, special multi-channel sound, giant screen, new kind of lamp house. It requires that the theater be totally converted—a whole new sound system, sometimes a reorientation of the seats. The screen occupies a large proportion of your field of view—more than Cinerama—and is slightly curved, though not as deeply as Cinerama. The result of the process is super-realistic.

Realism. That's the quest of Super 70. "When I began this project I wanted to know what creates realism and dimensionality in a motion picture and how those qualities could be improved." Television has a quality of aliveness to it that is lacking in film. "If one could take this quality of live TV and combine it with the resolution and color saturation of 70mm film... well, you've got yourself one hell of a movie."

It has been and still is a long term project to make what Doug Trumbull hopes will be a quantum leap in motion picture technique. "Long-term not only in the conversion of my studio equipment (I took on *Close Encounters* to get

Below Right: The visual poetry of Doug's directorial debut in *Silent Running* is typified by this sequence of the *Valley Forge* silently gliding past Saturn. Success for this sort of film effort rests on very close communication between director and special FX artist. Right: *2001* had just that sort of closeness.

Photo: ©1972 Universal

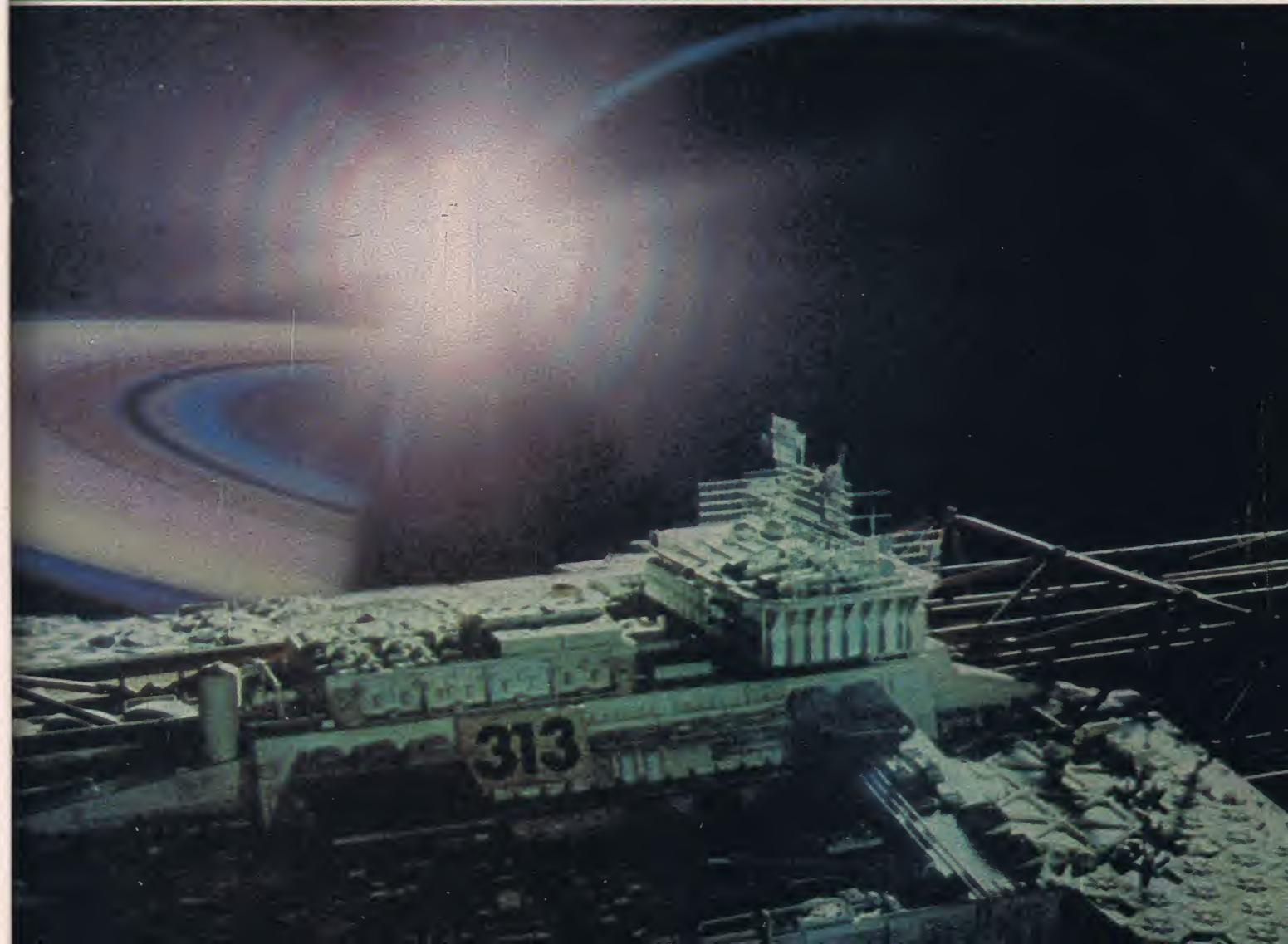
hold of the necessary 70mm cameras, editing systems, and optical printers) but to make a first film. I think that *Brainstorm* will be a very unusual film not only for its Super 70 format but for its content—it should be a mind-bender."

The problem is theater conversion. "Theaters all over the world will be asked to convert at pretty considerable cost just to be able to exhibit *Brainstorm*; beyond that we must be able to guarantee to the theaters that there are more films coming their way. It's a monumental long term commitment."

The conversions will take many steps. First there is the projection system: 70mm at 60 frames per second. Why 60 frames?

In an effort to improve the illusion of reality, Doug studied a number of existing systems, such as 3-D, which has never made it as a major process. Why? Doug thinks, after studying the systems and making a few test films, that there is no future in 3-D films as they are made now and viewed with Polaroid glasses, because eyestrain is intrinsic in the process. In projection, the stereo image is causing your eyes to converge and diverge* just as they do in real life. But in real life, the focus point is coincident with the convergence point. This is not the case with 3-D projection. In the theater your eyes always remain focused at the plane of the screen, while the con-

*For a complete review of 3-D systems see STARLOG No. 5.





Above: Perfection in composite work: this frame from CE3K consists of a four-foot model ship, front-projected star field, five foot miniature mountain, live action insert, and matte painted landscape.



Photos: David Hutchison

President of Future General, the very young Douglas Trumbull, shows off his display boards for two of the research and development projects that are occupying him at the present time: *Showscan*, now renamed *Super 70*, and *Cineride*. The two projects typify Doug's interest in revolutionary motion picture techniques—*Super 70* for improving theatrical films, and *Cineride* for amusement parks.

vergence point moves back and forth—the result: eyestrain, or musculature discomfort.

3-D films still didn't look real, they just looked 3-D; which is fun, but it wasn't what Doug was after.

Doug realized that movies were being made at the lowest possible number of frames per second.

A motion picture is usually defined as an assemblage of still photographs viewed in rapid succession. The property of persistence of vision makes one image flow into another so that the illusion of movement is maintained. According to Doug Trumbull, "the way movies are made at twenty four frames a second, or home movies at sixteen or eighteen frames a second, is right at the threshold of human acceptability. Fewer frames per second or fewer flickers of light per second will break down the illusion of motion."

"I wanted to know the maximum number of frames per second that the human mind could assimilate. The current practice in movie exhibition is to project at 24 frames per second; that is

24 fields of information per second. However, in order to compensate for the flicker of light that would be perceivable on a big screen, each frame is shown twice, so that the flicker rate is 48 flashes per second and therefore is much less noticeable to the human eye.

But, it turns out, the eye is capable of handling much more than 24 frames a second. "The real world doesn't exist as a series of still photographs; it's a continuum of motion and information. It's amazing how much the human eye sees and can observe in a short span of time."

It is the disparity between what the human eye is capable of and current standards of photography and projection that hampers the illusion of reality in motion pictures.

To test various frame rates Doug projected films made at high speed rates and those made at the standard twenty-four. He wanted to establish a relationship between the people's physiological response to something their mind perceives as real with motion pictures made at various frame rates. A number of UCLA students were used as guinea pigs and their EEG's monitored to measure their responses. Analysis of the charts showed the physiological response to

Below: Director Trumbull lines up a scene on the set of *Silent Running*. Bottom: Trumbull gives direction to two of the robot drones used in the film. The lovable robots very nearly succeeded in "stealing" the picture.

something that the mind believes is real increased fivefold when the frame rate approached sixty per second.

The projector modifications are considerable. In addition to the increased frame rate, the lamp housing has been redesigned to increase screen illumination several times. There will be no reel changing for a 90 minute feature. The film will lie on a platter wound on a core. The platter filled with film will be about eight feet in diameter and weigh about one ton. That's a lot of film. But the system doesn't use up as much film as the wall-sized I-max 70mm system at the Air & Space Museum at Washington's Smithsonian. The I-max uses three times the frame area of normal 70mm. The I-max is also plagued with flicker problems due to its immense screen and strobing problems involving the twenty-four frame per second format. "You have to be very careful how you move and pan the camera, since images can jump six feet during a pan on that enormous screen."

Super 70, with its new cameras, projectors, and screen size will also have to make use of a new sound system to deliver what Doug believes will be "the ultimate motion picture experience."

The new sound system, which still has a number of patents pending, will be a six channel system. But each channel is broken down into four distinct frequency bands and separately amplified and fed to speakers designed for that frequency band. The theory being that a more efficient, low distortion amplifier can be built more economically if it just has to handle a portion of the audio frequency range. Also the amplifiers will be high powered to allow full dynamic range for the audio signal without distortion. The sub-woofer (deep bass) is a horn with a frontal opening of eighty-five square feet! This, plus the midrange and tweeters, are multiplied by the six channels into a sound system that should leave Sensurround in the dust. Doug Trumbull expects to have a sound delivery throughout the entire acoustic range that is second to none. In addition to the realism of a clearer, brighter, sharper, more detailed, Super 70 image, he hopes that the sound system will create a psycho-acoustic environment for the audience.

Each theater will have to be individually tuned to the sound system. Engineers will analyze the theaters with modern sophisticated real-time spectrum analyzers and graphic equalizers to tune all the peaks and valleys out of the acoustic response of the theater. "We have developed electronic monitoring devices that will measure the amount of acoustic absorption by the audience (determined by how many are present and what they are wearing) and automatically adjust to the levels of the various channels and amplifiers.

"To achieve a psycho-acoustic illu-

Photo: Courtesy American Cinematographer



Filmed on the old US Navy aircraft carrier, *Valley Forge*, *Silent Running* marked the directorial debut for the artist who had first won recognition for his spectacular and trend setting work with Kubrick's *2001*.

sion we will be constantly monitoring the quality of the sound in the theater. By experience, the human ear learns that certain qualities of sound signify different shapes and sizes of rooms.

"Certain kinds of environment generate a particular quality of sound and vice versa." To a limited extent this is done today when the sound track is being mixed down by the editor. "We intend to go beyond that to heighten the illusion of reality. Our systems will monitor and create the sound effects in the theater.

"What goes on in most theaters today is the worst, so that any improvement like Dolby, or Sensurround is worth having."

Steven Spielberg says: "My pet peeve is that theater managers and exhibitors for decades have refused to update their systems. We bust our asses trying to give you terrific sound, and they play it back through what looks like stereo speakers in your car—fifty years old. There are only about 200 theaters capable of giving good quality sound. The other 1500 or so are still back in the 'Vitaphone' *Jazz Singer* days."

Doug Trumbull hopes to change all that.

The screen size will be interesting—current plans call for a screen 50 feet high and 110 to 125 feet wide depending on the aspect ratio (that is, the width of the film frame in relationship to its height).

"Paramount plans to convert a theater in the Los Angeles area this year to run my test film. The idea is to test the Super 70 with a live audience, get their reaction, and gain an idea of the marketability of the system—will movie-goers pay to see films in Super 70. Will the return be worth the investment?"

There are other applications, however, for the Super 70 process. An in-

(continued on page 62)



Photos: Courtesy American Cinematographer



in.print



Gateway by Fred Pohl
(\$8.95 in hardcover from St. Martin's Press; \$1.95 in paperback from Del Rey Books.)

Every so often a science fiction book appears wherein the action-adventure storyline occasionally takes a backseat to the author's style. In *Gateway*, the kinetic plot ives for reader attention with Frederik Pohl's brilliant overview of a slightly aberated vision of tomorrow. Pohl is a mastercraftsman at portraying seemingly normal future worlds that are anything but. With tongue occasionally colliding with cheek, he has created some of the most subtly frightening futures in SF literature by simply taking the popular themes of today and battering them gently into a future twisted tense. In past works such as *The Space Merchants*, *Gladiator-at-Law* and *Search The Sky*, he has taken society's fascination with finance, law and greed and turned them into beloved nightmares.

In *Gateway*, Pohl deftly tosses man's preoccupation with both monetary and spiritual bliss directly in the path of a free-wheeling space storyline brimming with action. Robinette Broadhead is a man plagued by his past, his present and his future. A space prospector, Broad-

head joins the legions of hopefuls who literally spend their lives chasing blindly after wealth at Gateway. Gateway is a space station, constructed by aliens, which houses a fleet of pre-programmed alien ships. Both the way-station and the vessels are the product of the vanished Heechee race, a species which remains a total mystery to Mankind.

No one knows why *Gateway* exists. Or why the ships are there. Or who the Heechees were. Regularly, however, the Heechee ships take handfuls of human hopefuls to strange and unknown destinations . . . before returning automatically to their base. Those who risk the ride pray for the discovery of untold riches at the other end of the voyage. Some return laden with fantastic treasures. Others don't return at all.

Robinette is no swashbuckling hero. He doesn't particularly enjoy his space prospector status. He's an ordinary citizen pressured by the economics of his time. An Earth miner, wallowing in poverty, his only ticket to the good life lies at *Gateway* . . . in an intergalactic game of Russian roulette.

Eventually, he succeeds in amassing a fortune. But how he does so causes a near mental breakdown a few years later. *Gateway* swings, pendulum-like, between young Broadhead's search for the ultimate payload and a slightly older Robinette's struggle to come to grips with both his newfound wealth and his Heechee-spawned guilt. He is helped in the latter task by a Freudian computer psychiatrist, Sigfried. In Broadhead's slightly out-of-kilter world, Sigfried often demonstrates more feeling and compassion than his exceedingly human patient. Together, man and machine attempt to unravel the mystery and terror that greeted Broadhead's incredible strike in unchartered space.

To Pohl's extreme credit, he recreates both of Robinette's nightmarish worlds with chilling authenticity. *Gateway*'s hero is a man of today, pushed just a little too far past the limit of endurance. However, even in Broadhead's dizzying existence, there is hope to be found. Using humor, bravado and gut instinct, Robinette succeeds in banishing the spectres of the Heechee ships from his psyche. Pohl suggests that, despite the rise of the super organizations, the

deification of the dollar and the reckless plundering of the environment, the spirit of man—the individual—the essence of man—will endure.

—Ed Naha



L-5 News

Published by the L-5 Society
1060 E. Elm, Tucson, Arizona 85719
(\$3.00 for twelve issues per year—by subscription.)

Behind its usual stark black-and-white cover the space colonization enthusiast can find over twenty pages of interviews, reports, news, historical items, articles, notes, pictures, drawings, and sale items, all in small print to make each item last. Everything needed for the seasoned reader or necessary for the interested novice.

L-5 is an organization dedicated to making space colonies a reality in a given area by a certain date. The area is known, not surprisingly, as L-5, named for a location designated by Joseph Louis Lagrange as 240,000 miles equidistant from the Moon and Earth, which would always gravitationally hold a colony in the Sun's light. The deadline date—1990.

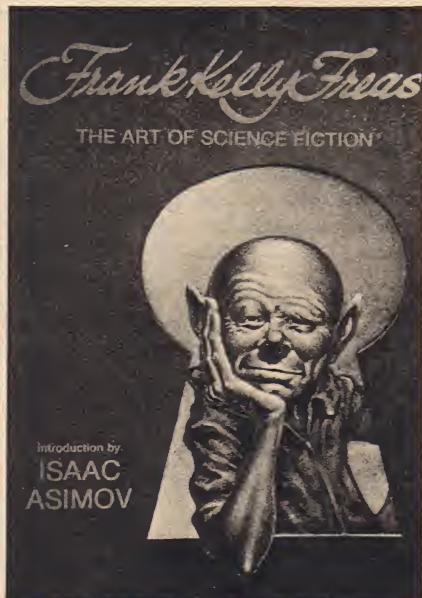
The L-5 organization is trying to prepare and educate the world today about this "final frontier," and the *L-5 News* is their forum. Although a non-profit, tax-exempt group, they make forceful arguments through various means. Whether it be coverage of Space Day in California, an eye-opening interview

with astronaut Rusty Schweickart, an examination of the Jewish faith in space, or even organized sports in space, I couldn't help but be swept up in the dream.

That fact is not really surprising, considering that their board of directors include Gordon Woodcock, the solar power satellite study manager for Boeing, Edward R. Finch, the chairman of the American Bar Association Aerospace Law Committee and the more recognizable names of Isaac Asimov, Robert Heinlein and Barry Goldwater, Sr.

The only problem beyond the constantly mentioned lack of funds is L-5's tendency to denigrate their detractors and the quality of the reproduced illustrations, which are jr. high school level in the issues I've seen. But even if individual artists seem overly optimistic or starry-eyed, they are outnumbered by practical, exciting concepts for making the possible future of space colonization a reachable reality.

—Richard Meyers



Frank Kelly Freas/The Art of Science Fiction by Frank Kelly Freas (\$7.95 paperback artbook from The Donning Co.)

Frank Kelly Freas is the most honored —ten Hugo Awards—and one of the most important of the SF illustrators.

I was a great admirer of Kelly's art in my pre-teen and early teen years, though at that time I was unaware of his accomplishments in the SF genre. I only knew him as the "creator" of Alfred E. Neuman, the impish mascot and logo of MAD magazine. It took several years before I discovered his incredible science-fiction art—and bemoaned all of the illustrations that I must have missed. That early disappointment has finally been remedied with the publication of this book.

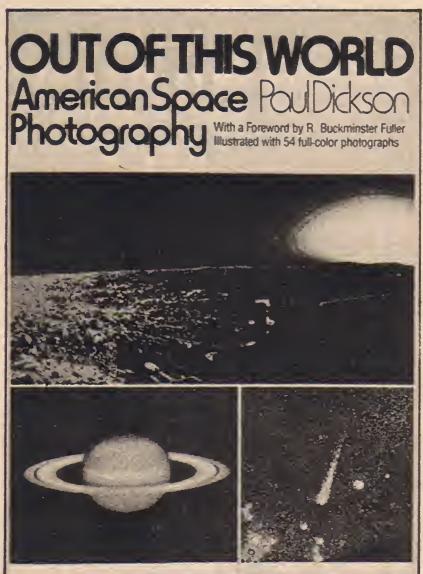
Kelly's volume is an important contribution on several levels. This is the

only artbook of commissioned work I have ever seen that has been put together by the artist. Kelly had a massive task: twenty-five years of illustrating in one-hundred-and-twenty pages. He has done a fantastic job. Laid out in chronological order (although it does skip around a bit), the book starts with the three covers Kelly did for *Weird Tales* in the early fifties. These are reproduced in full color, as are all of his illustrations. (There are also several pen-and-ink pages scattered throughout.)

The text is a fascinating running history of Kelly's SF career. He has also included hand-written explanations that give the reader an insight into the creative process in the formulation of each color illustration. Not only does this book offer a fairly comprehensive picture of the business and creative life of an illustrator, but the more astute reader can glean from his comments an interesting history of the SF magazine field—from 1950 to the present.

If you have followed Kelly's career, then you probably own a few of the hundreds of SF books and magazines for which he did cover and/or inside artwork. If you haven't kept them, you've at least seen them. Many of yours and my favorites are included in this volume. The cover, in fact is probably his most famous—the illustration for "Martians Go Home" by the late Fred Brown. (And if you look closely, you can see the visage of ol' Alfred E. in the face of the little green man.)

The Art of Science Fiction is as important a book as it is fun to look at and read. Every fan of the genre should own a copy.



Out of This World/American Space Photography by Paul Dickson with a Foreword by R. Buckminster Fuller (\$9.95 in oversized paperback—A Delta Special from Dell Publishing)

The field of space photography is barely twenty years old, but it has

already made significant contributions to various Earth sciences and, more importantly, to Man's picture of what we are, the nature of our planetary ecology (as well as the nature of the Universe) and how we fit into the scheme of things.

The foreword to *Out of This World* by Buckminster Fuller, considers the broader, philosophical implications of the information we have received through the camera's eye. And to his credit, it is couched in strictly logical, scientific terms—yet the awe-inspiring nature of his statements shines clearly through. Fuller (author of *Operating Manual For Spaceship Earth* and father of the "geodesic dome") points out that the camera is also a time machine, recording the fires that burned on distant stars millions and billions of years ago.

Included in Fuller's defense of increased photographic information-gathering is an amazing definition of the Universe: "As Einstein said, the Universe is an aggregate of non-simultaneous and only partially overlapping and variously enduring energy transformation episodes, and that is the description of a scenario in which one picture tells us virtually nothing regarding the scenario. A single frame picture of a caterpillar does not tell us that the caterpillar is going to transform into a butterfly, nor does one picture of a butterfly tell us that it can fly."

Paul Dickson (author of *Think Tanks* and *The Electronic Battlefield* among others) is more concerned with the technological and application aspects of space photography. His text is an interesting history of the field, from John Glenn's first crude, sub-orbital pictures—which proved that the Earth could be photographed for study from space—to the amazingly successful robot cameras on the Mars/Viking landers. Between those two events is a capsule history of the various Earth satellites: meteorological and geological surveys, resource mapping and the mapping of the stars.

There are fifty-four full-color photos in the book and the quality of the reproduction is excellent. The subjects include superb satellite photos of the Earth; shots taken by American astronauts of each other, the Earth from orbit and their vehicles in space; some famous photos by the Apollo crewmembers of the lunar surface and "Earthrise" as seen from the Moon. There are also a dozen pages of photos of Mars, Jupiter and other bodies in the solar system, and many pages of black and white photographs as well.

Whether your interests lie in photography, astronomy or planetary sciences, I think you'll find that *American Space Photography* is definitely *out of this world*.

—Howard Zimmerman

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two-record set, hear the multi-talented Leonard Nimoy as you've never heard him before. Listen to Nimoy render novel material taken from *Star Trek* where he portrayed the famous alien "Mr. Spock," and from *Mission Impossible*, where he was known as "Paris," the man of a thousand faces. Be touched by Leonard Nimoy's own interpretations of some of the most beautiful contemporary standards such as "If I Were A Carpenter." Whether the mood is philosophical or introspective, Leonard Nimoy creates the impression that he is singing to you alone. Be sure to order your own most appropriately entitled **Outer Space / Inner Mind**, two-record set today for only **\$7.50**. Remember, it's a limited offer!

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TRUMBULL

(continued from page 59)

terest in the amusement park business has been in the back of Doug's brain for some time. Theme parks such as Disneyland and Walt Disneyworld have made extensive use of "dark rides." The Haunted House in Disneyland is an excellent example. Disney makes use, of course, of their audio-animatronic robots to create an illusion of reality with people, animals and places. Perhaps the greatest of these is "Pirates of the Caribbean" in which spectators move in small boats through underground caverns passing various scenes of pirates in action. It's quite thrilling and great fun. It does, however, take up a great deal of space, requires skilled maintenance and is expensive to build.

Doug Trumbull's *Cineride* would make use of the Super 70 film system to heighten the illusion of reality. The small car or boat would pass through areas, such as a haunted house, in which most of the wall space would be taken up by a rear projected Super 70 image.

In principle, other than the extreme quality of the Super 70 image, film in dark rides is nothing new. But again Doug Trumbull has invented a new method for the filming that achieves the illusion of three-dimensional perspective.

As the car moves past an ordinary rear projected image, even a Super 70 image, there is no change in the perspective. As the viewer travels along at a foot per second, it's like driving past an animated billboard. Flat. But if the original scene is filmed with the camera moving along a motorized track at one foot per second and panning in the same motion that the viewer's head would turn while the car moved, then the image seems to have real depth and reality becomes very difficult to separate from illusion. The system has the advantage of being able to use human actors instead of being limited to intricate and costly robot machinery.

Though Super 70 and Cineride are still in their developmental stages, their impact could be revolutionary in the history of the motion picture and its applications. It is no wonder these new processes are making special effects artists into box-office stars. In the future we may expect to see fans flocking to see films from the workshops of the new heroes of the imagination. Where once people stood in line to see Gable or Monroe, lines will soon be forming to see films by John Dykstra, Ray Harryhausen, Doug Trumbull or any of a dozen other great special effects artists.

Doug Trumbull sees no reason not to expect that, as with the stars of the golden era, special effects artists will soon have their names above the titles. **F**

Gizmo

By GEORGE HOWELL

MY ANTENNA IS
SORE ... MY NOSE
SQUEAKS WHEN
I WALK... MY KNEE
JOINTS ARE LOOSE
... MY TRANSISTORS
ARE TIRED...

I'VE CREATED
A
HYPOCHONDRIAC!



George Howell

The man-powered *Gossamer Condor* soars in the air at an altitude of 11 feet. The accomplishment won an \$86,000 prize.

Pedal-Powered Flight



By CHARLES BOGLE

The desire to soar through the sky like a bird is as old as Mankind itself. It wasn't until recently, however, that Man actually made this dream come true. At Shafter Airport in Shafter, California, Dr. Paul MacCready's home-made *Gossamer Condor*, a human-powered airplane piloted by 24-year-old Bryan Allen, flew into aviation history. Causing an uproar in the scientific community, MacCready's team of modern-day descendants of Daedalus not only took to the sky, but also picked up an \$86,000 reward for being the first human beings to accomplish the bird-like feat.

The prize dates back to the 1950s when British industrialist Henry Kramer, in conjunction with Britain's Royal Aeronautical Society, proposed a cash reward for the first courageous person to succeed in flying through air without the aid of stored power. The Society set down a list of requirements that, for twenty years, aspiring flyers had found impossible to surmount. But last year, much to the Society's chagrin, MacCready, Allen and company pulled it off.

How did they succeed when others failed? Ingenuity. MacCready's *Gossamer Condor* wasn't based on conventional airplane design, but rather on hang-gliding techniques. The vehicle, according to its inventor, "is a mixture of the simplest and most advanced aerodynamics technology. It's the absolute minimal airplane." MacCready is no stranger to the world of invention. As President of AeroVironment, Inc., he and his crew designed the AeroBoost—a device which decreases the aerodynamic drag of trucks and yields fuel savings of up to 20% on some vehicles. While the

AeroBoost does not resemble the *Gossamer Condor*, it represents a similar design philosophy in optimizing and controlling fluid movement.

MacCready was after a lightweight, durable vehicle. After twelve months of testing miniature models and developing full-scale ones, his team came up with the finished *Gossamer Condor*. The fuselage is constructed of balsa wood, Styrofoam, corrugated cardboard and Mylar. It stands 30 feet long and 8 feet high with a 96-foot wingspan and a total lifting area of 835 square yards. Yet, the finished plane weighs only 70 pounds. MacCready and his team constructed the craft to be light for maximum lift at minimum speed.

Once the plane was constructed, Bryan Allen, a long distance bike rider and hang glider entered the picture. Seated in a reclining position with both hands free for control, Bryan learned to

24-year-old Bryan Allen shortly after his successful voyage. Bryan, an expert biker, had to pedal for weeks to prepare for flight.



Photos: Judy MacCready

pedal furiously for lift-off while maneuvering the plane's on-ground and in-air actions. He was taught to hold the handle of the control cane with one hand (the cane affects yaw, roll and speed) while working a lever behind the seat with his other (the lever controls wide turns). Because of the plane's durability and easy-to-repair nature, the flight crew was able to test extensively, with over 400 experimental flights logged before the final success. During these tests, Allen grew accustomed to the unique design of the *Condor*, gaining speed and altitude on each subsequent tryout.

Then, last August 23, the aircraft took off at 7:30AM. It landed 7 minutes 27.5 seconds later. It took 6 minutes 22.5 seconds to complete the course required by the Society. The *Condor* flew a figure eight course around pylons one-half mile apart, soaring over a 10-foot high hurdle at both the beginning and the end of the run. The flight speed hovered between ten and eleven miles per hour with Allen pedaling furiously to keep the craft airborne. The *Condor* logged 1.35 miles in the air from take off to landing; the actual flying circuit was 1.15 miles.

An exhausted Allen landed amidst cheers of congratulations. MacCready and his crew had done it. In an age of Concordes, Mars probes and Voyager spacecraft; they had succeeded in giving Man his wings. At present, MacCready is planning possible applications of the *Gossamer Condor* techniques, envisioning a time when bicycle riders, using a smaller, streamlined craft, can fly for miles with very little effort and absolutely no fuel requirements.

The British Royal Aeronautical Society is reinstating their cash prize. Next time out, however, American entries will not be accepted.

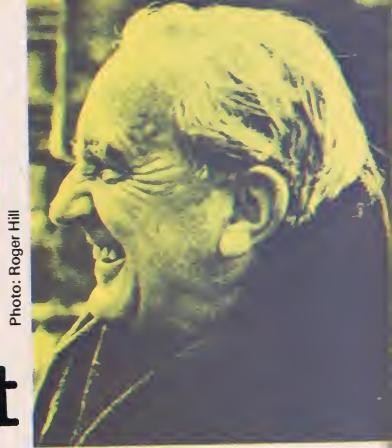


Photo: Roger Hill

How to Market A Myth The Saga Of The Hobbit

By JOSEPH KAY

A reserved young resident of a quiet, out-of-the-way world rests uneasily in the familiar comfort of his home. . . . One day he encounters an elderly wizard—one who is in touch with and in control of a mysterious, magical force. The mage calls on the innocent to abandon his home and go to meet his destiny. Against his will, the unlikely hero embarks on a quest for revenge and reparation, swept along by forces whose nature he can only begin to guess at, but will quickly learn to use. For the aged mystic will shortly disappear and his guidance will be felt only at the edges of perception. . . .

No, this is not a description of *Star Wars*. For the lands that this young hero must cross are not filled with Wookies, androids, Jawas and Tusken Raiders—rather he must deal with elves, fairies, trolls, dragons and gollum. The hero, in fact, is a hobbit. He is Bilbo Baggins, title character of *The Hobbit*. And the similarity with *Star Wars* is far from accidental. George Lucas' monumentally successful space fantasy is—in essence—a fairy tale. Perhaps, as some suggest, the ultimate fairy tale. But the formula for such grand mythos was never a secret. It is presented for all to see in Walt Disney's brilliant animated movies *Snow White* and *Pinochio*, and to be read in the pages of John Ronald Reuel Tolkien's life's work: *The Hobbit*, *The Lord of the Rings* trilogy and *The Silmarillion*.

Since its first publication in 1937, Professor Tolkien's *Hobbit* has sold millions of copies worldwide, exposing countless readers to his wonderful world of enchantment, adventure and faerie—Middle Earth. The realm of faerie, according to the late master of myth, "contains many things besides elves . . . besides dwarfs, witches, giants or dragons. It holds the seas, the sun, the moon, the sky, and the earth and all things that are in it: the tree and bird, water and stone, wine and bread, and ourselves—mortal men."

Tolkien followed *The Hobbit* with his three volume fantasy epic, *The Lord of the Rings*, published between 1954-56. Ten years later it had amassed a



Photo: © Rankin Bass

Above: TV's Bilbo Baggins lights the way for adventure. Top of page: Gandalf, Thorin Oakenshield, Gollum and the Goblin King cavort while author Tolkien looks on.

broad cult following of Middle Earthers who delved into all of the shadowy nooks and crannies of the books—seeking hidden messages and new levels of appreciation and understanding.

But when Tolkien was asked if he approved of the search for allegory in the heart of faerie, he replied, "I do not; while I'm alive, anyhow." Nor would he voluntarily fill in any of the more enticingly ambiguous details. When he illustrated a special edition of *The Hobbit*, Tolkien took great care with what he pictured in his paintings. They are *scene-setters*—that is, they reveal the strange lands, the volatile environments within which the dramas unfold. But he avoided his heroic creations. Bilbo Baggins is never seen in close-up or portrait. The mind's eye of the reader must fill in the details. At least that was the case, until recently.

Last fall NBC presented a ninety-minute adaptation of *The Hobbit*, produced by Rankin-Bass Productions and animated by a studio in Japan. It took five years and three million dollars to

bring it to the American TV screen. It was the most expensive animated show in TV history—and did well in the ratings, scoring in the "top ten" shows of the entire week. It was heavily "scored" as well, featuring over a dozen songs (some of which came at the oddest moments and were of questionable necessity, to say the least). Dedicated fans and followers may object to the presentation but the goal of the animated special was profit for the producers, sponsors and network; portraying Professor Tolkien's fantasyland accurately was not the highest of priorities.

"If *The Hobbit* is a success on television," co-producer Arthur Rankin Jr. said shortly before the show aired, "we will release it in theaters. Then we will go on to complete our next Tolkien work, which will continue the characters we have established in *The Hobbit* and will be adapted from *The Hobbit* and the last book of the Ring Trilogy, *The Return of the King*. At this point we are scripted, the music is composed and recorded, our backgrounds painted, the sound track is partially completed and new characters are designed."

The key to the look of the "new characters" may well be which actors are doing the voices. In *The Hobbit*, Orson Bean spoke for Bilbo and the diminutive creature bore an uncanny resemblance to the human actor. Gandalf's voice—and face—was that of John Huston; Thorin Oakenshield's was Hans Conreid.

There will also be another animated Tolkien feature in 1978, if production stays on schedule. Ralph Bakshi, the highly talented and controversial creator of *Fritz the Cat*, *Heavy Traffic*, and *Wizards*, is preparing a six million dollar adaptation of *The Lord of the Rings* for United Artists. Bakshi's two-hour feature will be based on the first volume, *The Fellowship of the Ring*.

But this young animator's route to the ring has been distinctly different from Rankin-Bass. He stated recently: "I showed United Artists four minutes that I had done over the years. I've been chasing it since 1956." That means that Bakshi will have spent twelve years pursuing the visualization of Tolkien by the

time his film premieres, Easter of '78.

J.R.R. Tolkien did not write his fantasy saga with movie adaptations in mind; it is not easy to illustrate or animate. MGM, the studio that successfully re-created *The Wizard of Oz* as a feature film, also thought about doing the Rings. After a few years of development, they abandoned the project. The logical company to tackle Tolkien is, of course, Disney Studios. And they did. For over six years Disney owned the rights and his artists searched for the right way to bring *The Hobbit* to life. They, too, abandoned the project.

But the fact that the late storyteller's work is so popular, so well-known, meant that the animated productions—both televised and wide-screen—were inevitable. And Rankin-Bass' timing could not have been better. Their show aired during the peak of renewed interest in Tolkien. Only a few months earlier, *The Silmarillion* had been published posthumously by Tolkien's son. The old master had spent forty years working on this, the definitive, archetypical "tale of faerie." It is a giant work of literature and the demand for it is insatiable. In two months it had shot to the top of the national best-sellers lists, with over three-quarters of a million hardbound copies in print.

Now there are veritable Tolkien supermarkets in bookstores all across the country: Aside from his books, there is a series of large, full-color posters based on the Rankin-Bass animated musical. Also available are a deluxe *Hobbit* record album featuring all of the TV show's tunes and a thirty dollar gift edition of the book adaptation of the TV show—complete with illustrations from the feature-length cartoon. And there are Tolkien calendars, *Hobbit* desk calendars and buttons, Middle Earth maps and Middle Earth board games.

Hard on the heels of the avalanche of products rushed to the marketplace to capitalize on the success of *Star Wars* is the Tolkien boom. With this year's new TV specials and feature films will undoubtedly come all manner of Middle Earth paraphernalia, from bibs to beds.

"If you really want to know what Middle Earth is based on," Professor Tolkien once mused, "it's my wonder and delight in the earth as it is, particularly the natural earth." Middle Earth may be a clean, untouched vision of the beauty and mystery of Nature, but unfortunately in the world of business, "wonder and delight" have been translated to read "dollars and cents."

Art. © Houghton Mifflin



Two versions of the same scene. Smaug meets Mr. Baggins in the treasure-laden cavern. Above right: As envisioned by Tolkien himself. Right, as illustrated for television.

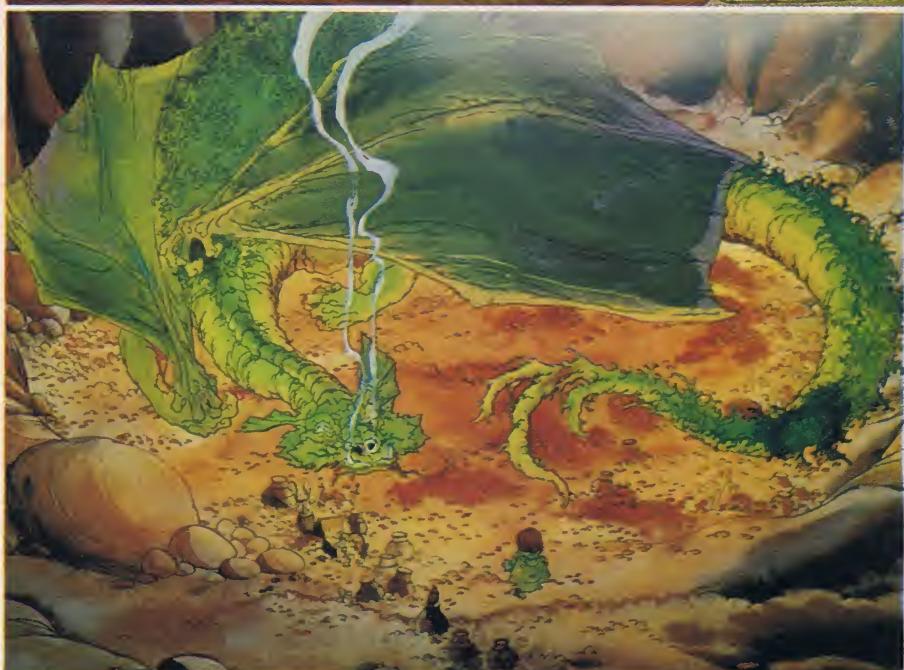
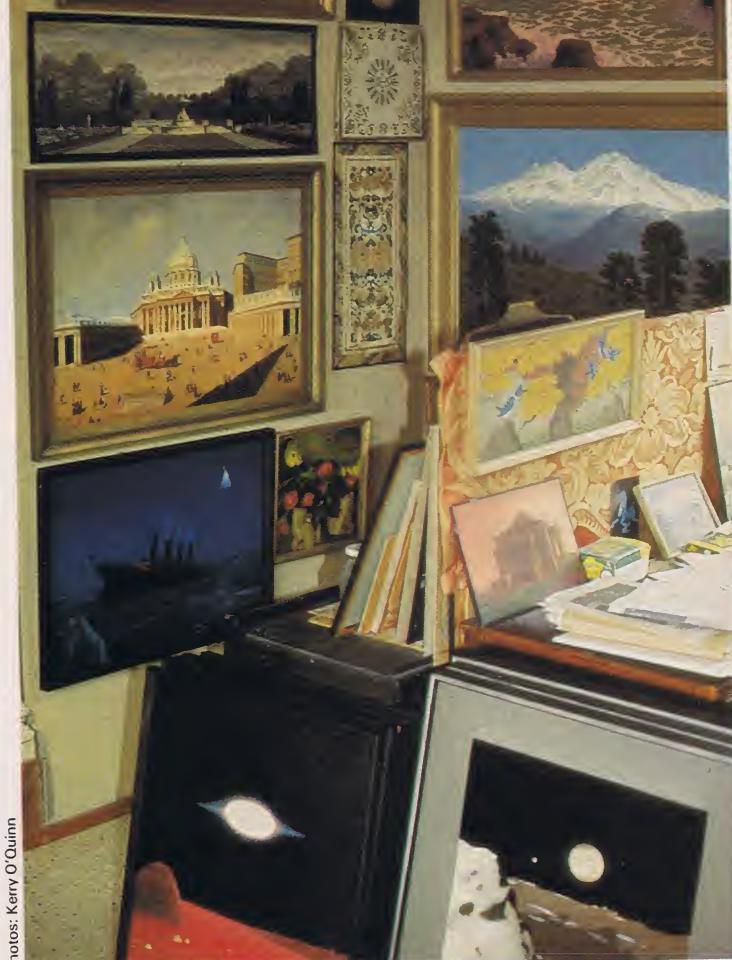


Photo: © Rankin Bass



Photos: Kerry O'Quinn



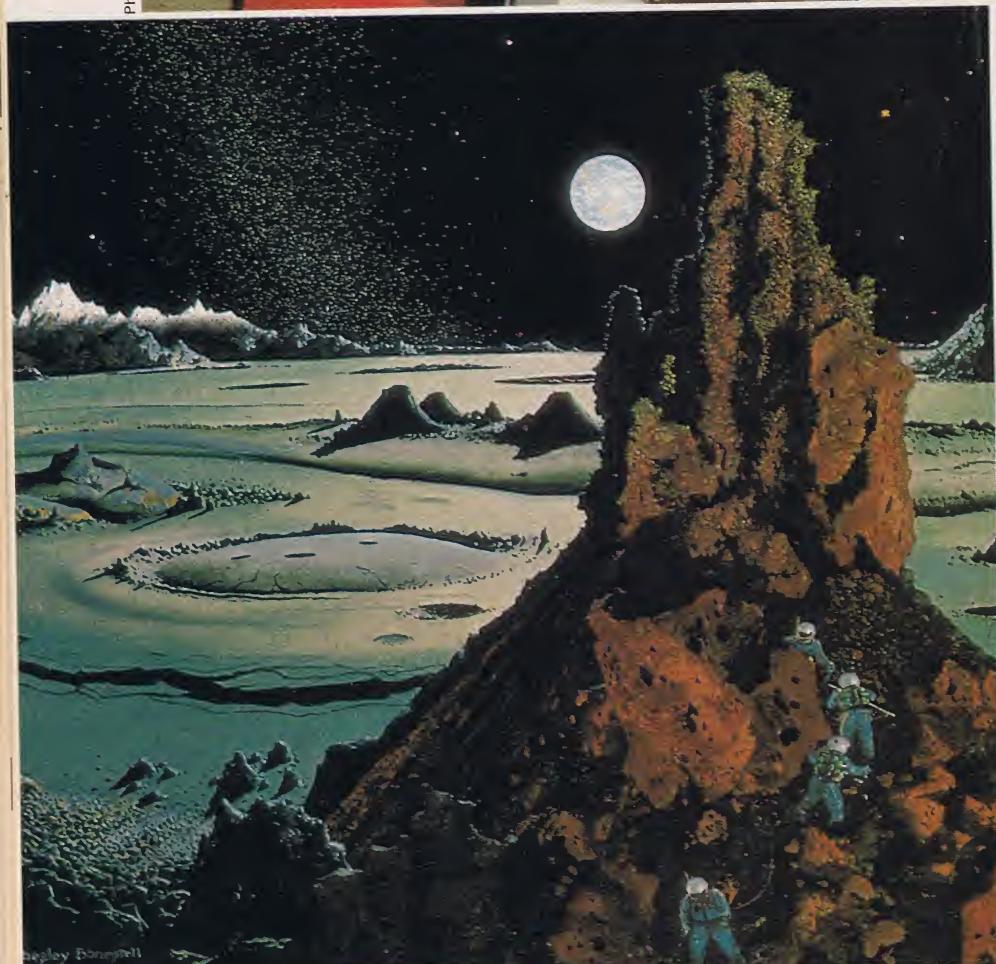
By DAVID HOUSTON

This past New Year's day, a 90th birthday was celebrated without fanfare, without the usual fuss and social trapping of such an occasion, on a hilltop amid the splendid scenery of the mountainous California coast. That's the way the celebrator wanted it; Chesley Bonestell is a quiet man, private, self-contained.

Yet his art has been more influential than that of Picasso, Pollack, Warhol, Chagall and the rest of the modern artists combined—in terms of shaping the world we live in and the universe we hope to inhabit someday. Millions of science and science-fiction enthusiasts the world over would go so far as to call Chesley Bonestell the greatest living artist. This article is intended to prompt a nationwide standing ovation, a birthday cheer directed westward to a studio in Northern California; a studio on stilts raised above the treetops, where each day the master paints.

"Do you want to go up to the

Above left: a corner of the artist's studio indicates the range of his subjects. Besides seascapes, landscapes and spacescapes, note the St. Peter's architectural painting and the *Titanic* sinking at night. Above right, on the steps to his private studio, Bonestell surveys the California vista. Left, a typically-beautiful lunar exploration illustration.



He visited the planets and satellites of our solar system decades prior to Sputnik's launch; he made footprints on the Moon long before Neil Armstrong; he showed us our galaxy from a distance of thousands of light years; his scientifically accurate visions of fanciful journeys and of other worlds helped convince a skeptical public that Man's destiny lay outward toward the stars.

Chesley Bonestell, Space Painter

THE MASTER AT 90

studio?" Bonestell inquired on the occasion of our recent visit. He gestured toward a wooden stairway leading up from the porch of his rambling hillside home. There's something of a secret research installation about his lofty studio, and something of a kid's treehouse.

Without waiting for a reply, Bonestell bounded energetically up the steps. He opened the door with great pride, his smile showing lines in a face that has experienced more happiness than tears.

The room is simple, with paintings everywhere. Jupiter seen from Callisto . . . San Francisco Bay seen from Earth orbit . . . a study for a mural of Saturn seen from Titan . . . a restoration of St. Peter's . . . antiquities crumbling at the world's end . . . the Titanic sinking with a distress flare rocketing above it . . . the space shuttle in flight . . . in the bathroom, the original of the panorama of the planet Zyra from *When Worlds Collide* . . . the treasures seem endless. The smell of paint and turpentine. A worktable. An easel.

Bonestell is a devotee of bad puns. His wife, Hulda, suggested he move his easel from the middle of the room. "That's easily done," he said.

Bonestell's career has spanned so many years and so many fields—fine art, illustration, architecture, astronomy—that it was impossible to avoid

mentioning his Renaissance nature.

"Only my extreme modesty prevents me from referring to myself as a modern-day daVinci," he agreed with twinkling eyes.

The fact that certain segments of contemporary society would disagree does not phase him. Asked if he enjoyed the company of those in the mainstream artistic community, Bonestell replied, "Certainly not! In the first place, I don't like artists and artists don't like me. I think most of them are frauds who move in because they find that they can make a mess of color. Like the fellow who took his nude model and rolled her around in a blanket and used the result as a painting. I believe that to be a good artist, you have to first be a fine draftsman, and few of them are draftsmen at all. I can draw if I want to, and draw very well indeed."

Chesley Bonestell drew his first pictures at the age of 5 in his native San Francisco. Then came an abiding interest in astronomy. "Seeing the planet Venus, so brilliant and ever-changing in the morning and evening sky excited my curiosity," he explained. "And at about 10 years of age I started to read books on astronomy." By the age of 12 he had won many school prizes and had taken his first instruction in painting.

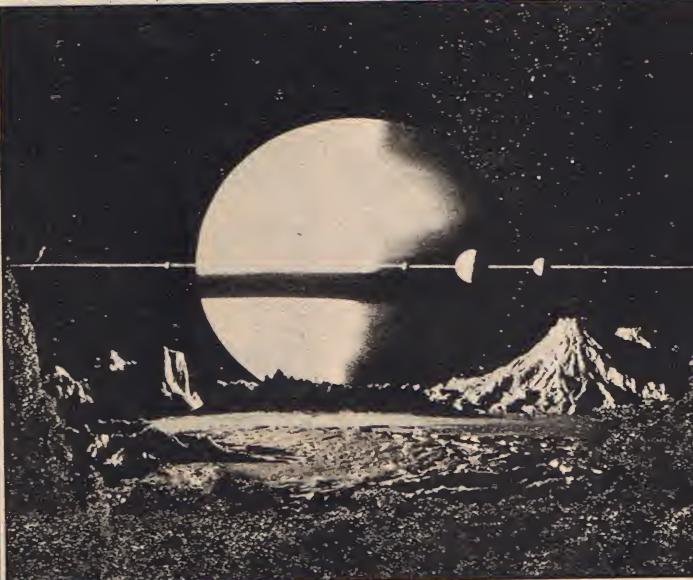
"When I was 17, an important event occurred in determining my future

career, although I little suspected it then." He was supplying illustrations for *Sunset Magazine*, which was then owned by the Southern Pacific Railroad. They paid him in rail passes. "One day a friend and I caught an early train to San Jose and hiked the 26 miles to the summit of Mt. Hamilton and Lick Observatory. That night I saw for the first time the Moon through the 36-inch refractor; but more impressive and beautiful was Saturn through the 12-inch refractor. As soon as I got home I painted a picture of Saturn."

And so began his love affair with the ringed planet which still persists. That first painting? It was destroyed along with all of his other existing work in the San Francisco earthquake and fire of 1906.

In 1907 Bonestell entered Columbia University in New York to study architecture. The departure from painting had been engineered by Bonestell's grandfather, who did not like the bohemian reputation that artists had and considered architecture more respectable. At Columbia, Bonestell mastered

*Material for this article was gathered during a personal visit with Mr. Bonestell and in addition was taken from the following sources: Mercury Magazine, May-June 1977; The Journal of the British Interplanetary Society; A History of Astronomical Art by Ron Miller (unpublished); Dr. Robert S. Richardson's acceptance speech on Bonestell's behalf on the occasion of Bonestell's receiving the 1976 Bronze Medal of the British Interplanetary Society; the April 21, 1977, edition of the Carmel Pine Cone; and information generously supplied by William C. Estler and Ronald T. Gallant.



Above: throughout the history of astronomical art probably the most popular subject has been Saturn. Here Bonestell renders the kind of close-up view (from an outer moon) that must leave many later space artists in his debt for his original visions.

Photos: Courtesy Smithsonian Institution

Left: in 1961 Bonestell illustrated a visit to each of the planets and wrote text for a special publication titled *The Solar System*. This was his view of Mars, complete with duststorms, whirlwinds of powdery sand, and in the distance, polar mountains.





Photo: © Paramount

the intricacies of perspective drawing that would later serve him so splendidly. "On my final examination I had to draw a mirror tipped ten degrees out from the wall, a chair tipped ten degrees from the mirror, and the reflection of the chair in the mirror. It was a very complicated problem."

Returning to San Francisco in 1911, Bonestell became a member of the American Institute of Architects, found employment in an architects' firm, and neglected astronomical painting until about 1918.

He explained how he returned to his first love. "It happened that John Hooker, who had donated the mirror for the 100-inch reflector on Mt. Wilson, was my uncle's brother-in-law. On that very thin relationship I wrote to Dr. George Hale, director of Mt. Wilson Observatory, and he sent me prints of the first photographs of the Moon taken through the big telescope. This revived my interest in astronomy and I occasionally drew pictures of Mars or lunar landscapes for my own amusement and then gave them away."

During this early architectural period, Bonestell designed residences and a number of downtown buildings in San Francisco; and he married his childhood sweetheart, Mary Hilton. In 1918 he and Mary separated. He headed for New York where, ironically, he contributed designs for the California Institute of Technology.

In 1922 Bonestell married English concert singer Ruby Helder and moved with her to London—where he immediately got work in advertising and newspaper illustration. He attributes this success "to American aggression." His unemployed friends believed it was bet-

Above: for the finale to George Pal's *When Worlds Collide*, Bonestell created a spectacular panoramic landscape of the fictional planet Zyra. Film viewers didn't believe the ideal beauty in the film's context, but on its own, this magnificent painting (never published) is Bonestell at his imaginative best.

ter to maintain artistic dignity than to "peddle" their wares.

"At this time Scriven Bolton was illustrating astronomical subjects in England," Bonestell recalled, "but it still didn't occur to me to try my hand at it seriously."

Back to New York in 1927—to take advantage of the great building boom of a runaway economy. Bonestell contributed work for the Supreme Court Building and other Federal structures in Washington D.C., the Chrysler Building in New York, the Sherry Netherland Hotel, and many other important buildings.

Following the Wall Street crash, Bonestell returned to San Francisco. He designed the color scheme for the San Francisco Opera House and produced perspective renderings that showed the inner structures of the Golden Gate Bridge. He painted the buildings-to-be of the Golden Gate Fair and Exposition; one of those paintings found its way onto a U.S. commemorative stamp. (The stamp was issued in 1938 when first-class postage was 3 cents.)

The Chesley Bonestell that the world now knows began to emerge in 1937 when William Van Alan, chief architect of the Chrysler Building in New York, visited California and told Bonestell he ought to be working as a special effects artist in Hollywood. Thanks largely to Van Alan's letter of introduction, Bonestell went to work for RKO in 1938, to become a matte painter.

In his pre-science-fiction days in the movie industry, Bonestell worked for RKO, Warner Brothers, Columbia, Fox and Paramount. To require a matte painter was to want Bonestell. Among his accomplishments were backgrounds

Left: a proposed panoramic view of the lunar surface intended for use in the 1950 film *Destination Moon*. Not used for the final Moon set, this previously unpublished rendering is a classic example of Bonestell's clean, artistic stylization.

Where Bonestell art may be viewed:

Adler Planetarium, Chicago, Ill.
Gallery of Astronomical Art: 15 paintings
Library: 6 paintings

Midwest Research Institute, Kansas City, Ks.—Approx. seven paintings
Smithsonian Air & Space Museum, Washington, D.C.

1 painting and 1 print on display
about a dozen others

Boston Museum of Science, Boston, Ms.
Large view of our galaxy seen from outside

Kitt Peak Observatory, Tucson
Galactic view mural

Oakland Museum Oakland, Ca.
1 painting from the Expo of 1939
Golden Gate Bridge Administration Building (Toll Plaza), San Francisco, Ca.
1 large painting of the bridge in foyer.



Griffith Observatory, Los Angeles, Ca.
1 painting

Hayden Planetarium, New York, N.Y.
The two art prints published by Bonestell Space Art

Marine Corps Historical Museum, Washington, D.C.
1 large painting depicting the taking of Iwo Jima, W.W. II

Huntsville Space Flight Center, Huntsville, Ala.—Several paintings

Flandrau Planetarium, Tucson, Az.
Milky Way Galaxy Mural

Books Illustrated by Bonestell: THE END OF THE WORLD

Text: Kenneth Heuer
Rinehart & Co., Inc., New York, 1953

THE NEXT 50 BILLION YEARS

Text: Kenneth Heuer (a revised edition of
The End of the World)
The Viking Press, New York, 1957



THE CONQUEST OF SPACE

Text: Willy Ley
The Viking Press, New York, 1949

THE EXPLORATION OF MARS

Text: Willy Ley & Wernher von Braun
The Viking Press, New York, 1956

ACROSS THE SPACE FRONTIER & CONQUEST OF THE MOON

Edited by Cornelius Ryan, text: Ley, von Braun, et al.
The Viking Press, New York, 1952 & 1953

THE WORLD WE LIVE IN

Edited by Lincoln Barnett,
Time Life Books, New York, 1955

THE WORLD WE LIVE IN

New York 1956

MARS

Text: Robert S. Richardson
Harcourt Brace & World, New York, 1964

MAN AND THE MOON

Text: Robert S. Richardson
World Publishing Co., Cleveland, 1961

Beyond the SOLAR SYSTEM

Text: Willy Ley
The Viking Press, New York, 1964

THE SOLAR SYSTEM & ROCKET TO THE MOON

Text: Chesley Bonestell
Columbia Record Club, New York, 1961
(this edition included a 45 rpm record and a selection of color slides of Chesley's art)

THE SOLAR SYSTEM & ROCKET TO THE MOON

Childrens Press, Chicago, 1968

BEYOND JUPITER: THE WORLDS OF TOMORROW

Text: Arthur C. Clarke
Little, Brown & Co., Boston, 1972

THE GOLDEN ERA OF THE MISSIONS, 1769-1834

Text: Paul Johnson
Chronicle Books, San Francisco, 1974

THE GOLDEN GATE BRIDGE, A TECHNICAL DESCRIPTION IN ORDINARY LANGUAGE

Text: E. Cromwell Mensch
E. Cromwell Mensch, San Francisco, 1935

OUR SOLAR SYSTEM

Text: the editors
Nat'l Audobon Society Nature Program, 1955 (Paste-in picture stamp book; stamps are Chesley's art)

THE PLANETS by Holst, a long playing record, Phillips 6500 072

has an album cover by Chesley showing Saturn seen from Japetus.

and "image replacements" for *Citizen Kane*, *The Horn Blows at Midnight*, *Mr. Deeds Goes to Washington*, *How Green Was My Valley*, *The Swiss Family Robinson*, *Mark Twain*, *The Magnificent Ambersons*, and the visually magnificent *The Hunchback of Notre Dame*.

Notre Dame, from the novel about medieval Paris by Victor Hugo, required the reconstruction, somehow, of the great cathedral as it must have looked hundreds of years ago set in a sprawling Paris of primitive houses and buildings. Literal full-scale reconstruction would have been economically preposterous; the use of miniatures would have severely limited combinations with live action; matte painting offered the only reasonable solution. In viewing the film today (it's often shown on television, usually around 3 a.m.) one simply cannot separate the three-dimensional pieces of scenery from the Bonestell paintings. Only the lower portion of the facade of the cathedral was constructed; everything above the first horizontal line is Bonestell's art—even in shots that show the facade, or portions of it, in radical perspective that exactly matches the camera angles of the real-life photography.

"As my knowledge of the technical side of the motion picture industry broadened," Bonestell explained, "I realized I could apply camera angles as used in the motion picture studio to illustrate 'travel' from satellite to satellite, showing Saturn exactly as it would look," from the various points of view.

He completed his Saturn series and sold it to *Life Magazine*. They were published in the May, 1944, issue. Later, *Life* asked Bonestell for a collection of paintings of the planets. Subsequently he was approached by *Astounding* science-fiction magazine and asked to prepare cover art. Bonestell's first *Astounding* cover appeared in October, 1947.

Astronomer Dr. Robert S. Richardson (with whom Bonestell worked on various projects) summed up the sequence of events: "Sometime after about 1946, he got an assignment from *Life* to do a double spread collection of paintings of the planets, for which he was paid \$30,000. They attracted wide attention, so that henceforth he was much in demand for astronomical scenes. Once he sent a cover painting to a science-fiction magazine, which he incorrectly addressed to another magazine. The magazine promptly accepted it. So he had to do another cover for the original magazine."

Richardson and Bonestell were first associated when, just after World War II, *Colliers Magazine* asked Bonestell to investigate whether it was feasible to send a rocket to the Moon with existing technology. At Bonestell's request,

Richardson interviewed engineers at the California Institute of Technology and found that it was indeed theoretically possible to send a three-stage rocket to the Moon and land a couple of pounds of flash powder. "But this was not sufficiently spectacular," Bonestell related, "and *Colliers* was not interested." But the *Colliers* project did not die altogether. A few years later the magazine wired Bonestell to fly to San Antonio to attend a meeting of scientists.

"They wanted me to find somebody who would be interested in sending a rocket to the Moon and then draw what they had in mind. When I learned that Wernher von Braun would be present, I told Ryan (editor of *Colliers*), 'There is the man to send our rocket to the Moon.'

"Later, von Braun sent me detailed sketches on engineering paper of what he expected to do. I kept all the sketches and have since sent them to the Smithsonian. Of course as things turned out, the machines that finally went to the Moon were vastly different from the ones he thought of, but his ideas were still extraordinary for his time."

The von Braun/Bonestell articles for *Colliers*, published in the early 1950s, covered the problems of achieving escape velocity, construction of spacecraft in Earth orbit, a trip to the Moon, and a trip to Mars. The extremely successful series gave the general public its first graphically realistic taste of the approaching exploration of outer space. Around the same time, many of Bonestell's magazine illustrations were collected and combined with new art to accompany Willy Ley's milestone book, *The Conquest of Space*. The volume, to this day, contains more of Bonestell's paintings—many reproduced in full color—than any other. (Now a premium find for collectors, the book was first published in 1949 by Viking Press.)

Bonestell left the studios of Hollywood to concentrate on book and magazine illustration—only to be called back by George Pal at Paramount. Bonestell was the only man Pal had for the job: to create the panoramic vistas of the lunar surface for his upcoming production of *Destination Moon*.

While somewhat dated now—in terms of hardware, computer science and the like—*Destination Moon* remains a model for accuracy and the blend of action and information in filmmaking. The script, conceived by Robert A. Heinlein, told of man's first journey to our neighbor in the sky and required views of Earth from orbit, a pass high over the surface of the Moon, a landing in a crater, and a to-the-horizon landscape on the lunar surface with a correctly proportioned Earth shining bright above the mountainous crater's edge. Bonestell made the as-yet-unseen vistas so convincing and beautiful that the possibility and desirability of such a



Below: soon after a lunar orbiter showed a close-up view of the gigantic crater Copernicus for the first time, Bonestell painted his own version—just for fun. The artist's wit is evidenced as one of the astronauts points to a smooth rock on which he has found a carving from a prior explorer—lunar grafitti.

Bonestell's typical combination of aesthetic beauty and technical knowledge is nowhere better seen than in his spaceship designs for George Pal movies. Top left: Sleek ship glides into Zyra's atmosphere in *When Worlds Collide*. Top right: Designed for vertical launch and landing *Destination Moon*'s craft sits amid a Bonestell lunar landscape. Above: Mars glider from *Conquest of Space* launches return rocket.



flight became evident to the lay public. NASA lists the release of *Destination Moon* in its chronology of the events inspiring and leading to Neil Armstrong's first footprint in the lunar dust.

"When Armstrong put his foot on the Moon," Bonestell recalled, "tears poured down. I wept. I broke down and cried. It was the realization of something I had been hoping for for a large part of my life."

With hindsight and the revelations of recent years, Bonestell can be critical of his early Moonscapes, including his work for *Destination Moon*:

"I should have realized that the Moon, without any atmosphere, must have been just beaten to smithereens by the constant bombardment from four billion years of meteors dropping on it. I tried to make it just as dramatic as I could, and, as a result, it looks ridiculous now. The Moon looks nothing like that."

Referring to the inappropriately craggy mountains, the cracked-lava lunar surface, Ron Miller, art director for the Air and Space Museum, said, "The Moon should have looked like its appearance in *Destination Moon*. Visually it was ever so much more interesting."

Bonestell was much closer to reality with his many paintings of the surface of Mars, which he painted sandy and rust-colored and strewn with loose rocks—thirty years ago!

His only mistake seems to have been his Martian sky. He was convinced,

along with most of the scientific community, that the sky would be blue, not the pink that NASA's lander shows us. One of his most famous and most frequently seen Martian blue skies appears in the introduction to another of Pal's films, *War of the Worlds*. In that sequence we are shown breathtaking views of many of the planets, including an animated miles-high lava flow on Jupiter—all of them rendered with pinpoint accuracy according to the knowledge available at the time.

Bonestell also created the gloriously frightening scenes of the approach of Bellus, New York inundated, the boiling sky at lift-off, the collision of the worlds, Zyra from outer space, the idealistic panorama at the end of Pal's *When Worlds Collide*. Bonestell's paintings for Pal's *Conquest of Space* (derived not from the Ley/Bonestell book of that name but rather from the Mars sections of the *Colliers* articles) stand as that film's main attraction. But Bonestell disclaims the film:

"The set designers decided to make the surface of Mars out of colored sawdust to represent the red dust, interspersed with 'rocks' of chunked coal and bits of broken glass. Mars looked nothing like that, I told them; but they wouldn't listen. So they made their *Conquest of Space*, and you know, to this day I still haven't seen this movie. Nor do I intend to."

Bonestell continued his painting for such space-science books as *Conquest of the Moon* (1953), *Life Magazine's*

The World We Live In (1955), *The Exploration of Mars* (based on the *Colliers* articles—1956), *Mars* (1964), and, with Arthur C. Clarke, *Beyond Jupiter* (1972).

More recently he has painted numerous murals for planetariums and educational institutions—including a spectacular 10' by 20' painting of our galaxy as seen from a hypothetical planet at a distance of 400,000 light years; the painting is on display at the Boston Museum of Science.

When Dr. Robert Richardson accepted an award for Bonestell, one giving recognition of a life of achievement by the British Interplanetary Society in 1976, Richardson said of Bonestell's career:

"He would accept assignments from educational institutions at a moderate price. But when it came to commercial outfits, such as movie studios, he stuck them for all he could get.

"One of his paintings he sold to a whiskey firm as an illustration for a calendar. The whiskey firm used the astronomical scene for a background, then got another artist to paint in a series of whisky bottles winding up to the heavens. His wife thought it disgraceful, prostituting his art for such a purpose. But so long as he was well-



Above: this lunar spaceship painting, used as cover and interior illustration for the *Conquest of Space* book, is considered one of the most significant American paintings (collection of William Estler).





Above: used for the jacket and an inside spread of the Time/Life book, *The World We Live In*, this shows Bonestell's imagination in the opposite direction to his usual—the past. Flowing with molten lava, the Earth's crust displays a panorama of birth traumas.

Below: The public grew to know topography of other worlds and celestial science through Bonestell's detailed book illustrations, like this jacket from *Man And The Moon*, showing exploration of the Jura Mountains on the Sinus Iridum as seen from a crater in Mare Imbrium.





Above: from *Exploration of Mars* the lander (see cover) approaches its destination backward in order to brake into orbit. Fuel tanks will be jettisoned before descent.

Below: the surface of Mercury from *Conquest of Space* book. Sun is three times larger than we see it, and astronauts are clad in insulating suits to protect from searing heat.



(collection of Fred Duran)

paid, Bonestell did not care about his relations to art and prostitution.

"In my opinion, Bonestell's masterpiece is his painting of Saturn as seen from Titan. Saturn is a narrow crescent in the 'new' phase with the rings very thin. Many times, when I have shown a lantern slide of this painting, it has brought an audible gasp from the audience."

"Although Bonestell made considerable money from his art, in his younger days I know he was not always so well fixed. He told me once he had to borrow a pair of pants while his own were being pressed. He cared nothing for ostentation: big cars, a large wardrobe, an elaborate house and grounds. His present wife claims he married her for her furniture."

Although he still paints astronomical subjects, as inspiration comes to him, he will proudly show visitors to his studio today examples from his most current project—a series of painstakingly researched paintings of the old missions of California, perfectly restored to the architectural glory they represented when they were new. For some of these, all he had to go on were photographs of the foundations and descriptions set down by travelers of the American West in centuries past. The mission paintings (still being displayed in galleries and offered for sale) were published in 1974 in *The Golden Era of the Missions—1769-1934*.

The great man is more than content with his life and accomplishments. "Oh, there were times when things were hard," he said, "but you always survive them."

He confessed to having an appreciation for a good dirty joke (as well as a good bad pun). "I'm not sure clean living is the answer to longevity," he philosophized. He still enjoys a double martini every night. "It's all a matter of glands. Guess I've got good ones. I've always enjoyed my life."

More seriously he reflected:

"I have known quite a few talented people who have frittered away their time being social, and some who still take art lessons in their middle age. It seems that the social aspects of the classroom are more attractive than sitting alone in your studio and working out problems by yourself—and usually every painting represents some special problem."

"I believe that everyone, to be happy through life, should have a hobby to enjoy until death. Then, at least from a purely selfish standpoint, your life will be a success."

So advises the man whose "hobby"—throughout his long and productive life—has given inspiration and pleasure to millions. In so doing he has participated in the most glorious endeavor of Mankind: the expansion of our knowledge into the limitless realms of outer space. □



Chesley Bonestell

Intolerant of artists whose painterly choices are pure whim, Bonestell can be counted on to have a hard scientific reason for every aspect of beauty in his works. Here the lunar surface is bathed in the orange glow of an eclipse (with the exception of distant mountains outside the shadow of the Earth). The color

is the combined light of the sunrises and sunsets of our planet—light bending through our atmosphere and streaming outward, as it always does, into distant space—occasionally falling upon the desolate surface of another heavenly body.

It is easy to predict the gadgets of the future. Science-fiction writers do it all the time. In the past we imagined television, atomic bombs, rockets to the Moon. Now we could look forward to other triumphs of science and engineering.

But what will *society* be like in the future?

Will there be a future society in the first place?—Perhaps not, if we really go all out in nuclear warfare.

Even if we keep the peace, will there be a comfortable society, a civilized society, in the future?—Perhaps not, if we go on as we are going.

There are over four billion people on Earth. We are having trouble feeding them and supplying them with the services they need. We are destroying the Earth's living space and resources to keep them alive and as nearly comfortable as they would like to be.

At the present rate of population increase, there will be eight billion people on Earth by 2015, and the chances are there will be no way in which our oil-depleted, soil-depleted, resource-depleted planet can support them, so that we are facing catastrophe in the course of the next generation.

That's one way of looking into the future of society—catastrophe and a new barbarism.

But will human beings just sit still and let that happen? Or will they, at the last minute, bestir themselves and take action to prevent destruction? Will they reorganize their way of life to allow civilization and comfort (or the chance of future comfort) to survive?

It will take many hard decisions, but suppose humanity makes those decisions. What will life be like in the future?

To begin with, population will have to be controlled. Human numbers must not outpace the ability of the planet to support us. The control can't be brought about through a rise in the death rate, since that is catastrophe (war, starvation, disease and anarchy are the great death-rate solutions.)

The alternative is to lower the birth-rate the world over. If that is carried out it means that women, the world over,

will lose their ancient function of being baby-machines. They will tend to have few children—one or two and, in many cases, none.

What are women going to do instead? Nothing?

Women will have to move into the world and take part in all the roles men have so long monopolized—business, science, religion, government, art.

Why not? Humanity needs all the brains it can get and by making use of women we double the supply without adding to the population at all.

In fact, it may be that only by allowing women to enter the great world can we successfully reduce the birth-rate. They will then be less anxious to have many children as the one way in which they can achieve personal status.

The society of the future will have to be a women's-liberation society—if we are to survive.

Does that mean that the society of the future will be increasingly one of old-age pensions, medicare, and social security? Will a smaller and smaller reservoir of younger people be required to support a larger and larger dead-weight of old people who are retired, pensioned and sick?

If so, society will break down even if there is no war and even if the population is controlled.

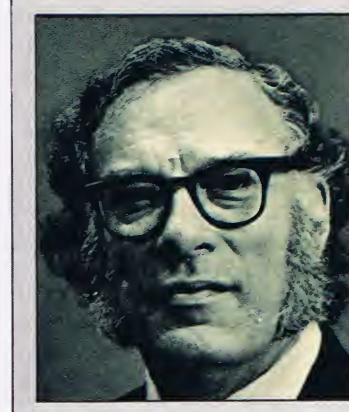
But must old people be retired, pensioned and sick? With advancing medical science, people will surely remain vigorous and capable into advanced years (we have already been moving in this direction for a century.)

To keep them mentally alert and creative, there will have to be a revolution in our philosophy of education.

Throughout history, education has been reserved primarily for the young and has been delivered massively, to large numbers at a time.

In the future, if we are to survive,

The Future of Society



Asimov

Isaac Asimov is one of the most prolific, well-respected, and well-read authors of the twentieth century. Dr. Asimov's books cover a wide variety of topics: science fiction, science fact, etymology, mystery fiction, American and world history, children's books and poetry—to name just a few. He has had over 180 books published in the past 26 years. Astronomer Dr. Carl Sagan has called Asimov "a natural resource . . . the great explainer of the age." Dr. Asimov has four IBM electric typewriters in his Manhattan penthouse apartment, but claims to use them only one at a time.

In a low birth-rate society, the percentage of young people will be very low—lower than it ever has been in human history.

On the other hand, if civilization survives, science and technology will continue to advance. In particular, medicine will advance and the life expectancy will continue to push forward. There will therefore not only be fewer young people, there will be many more old people.

education must be a life-long process and it must be individualized. Any human being, at any time, can be educated in any subject that strikes the fancy. This isn't so impossible if we take into account advancing technology.

If we consider communications satellites with laser connections, we can imagine every human having his or her own television channel on which an advanced and computerized teaching machine can operate. Such a teaching



machine could be hooked into a planet-wide computerized library containing the human reservoir of knowledge.

Between medicine and computerized education, human beings will remain both physically vigorous and mentally creative into advanced years. In other words, the society of the future will have to be an age-blind world—if we are to survive.

If we do survive, and if science and technology continues to advance, the work of the world will be increasingly done by automation, by robots, by computers. Human beings will have to fall back on *human* activities—on creativity, on the arts, on show-business, on research, on hobbies.

In short, the society of the future will be a leisure-oriented society, but not one in which people just kill time. They may well work harder than they do now, but at what they *want* to do—if we are to survive.

All of this can't be done simply by people alone. Humanity doesn't live in a vacuum; it must draw on the environment.

Most fundamentally, it must draw on

This stunning vision, both beautiful and nightmarish, is the work of artist J. Pitre. It is available as a poster, titled "Overpopulation," from AA Sales, Inc., 9600 Stone Ave. N., Seattle, Wash., which kindly gave FUTURE permission to use this art to illustrate Dr. Asimov's warnings about the dire consequences of mindless propagation.

energy sources and the most convenient source that humanity has ever known, oil, is now drying up.

There will have to be new sources. There are many small sources that can be used and all should be, but to run *all* the activities of humanity through all time to come there must be at least one large-scale source that is safe to use and will last for billions of years.

There are, actually, two such sources: nuclear fusion and solar power.

The chances are that both will be developed and both used, but there are reasons to suppose that, in the end, it may be solar power that will win out, and that such power will not be collected from sunlight striking the surface of the Earth, but from sunlight striking a collecting station in orbit about the Earth.

In fact, the space about the Earth has

a great many desirable qualities. It consists of an infinite supply of hard vacuum, it is exposed to extremes of temperature and to hard radiation, it can be gravity-free. All these properties can be useful to industrial processes and it would make sense to have factories in space. (Unavoidable pollution is better discharged in space than on Earth's surface.)

There could be laboratories in space where dangerous experiments can be conducted without risking human populations. There could be observatories in space where the Universe can be studied without the blanketing and distorting effects of an atmosphere. There could be settlements in space, where social experiment can be conducted, from where the rest of the Solar system can be explored, through which there will some day be room for population expansion once more. And all could be built out of materials obtained from our Moon.

In short, the society of the future will be space-oriented—if we are to survive.

The problems that face humanity now and that must be solved if humanity is to survive, face all nations alike. We live

(continued on page 51)



perspectives

A final word from the editor on the many worlds of science fiction

Most cliches are kernels of truth that have suffered from overexposure and simplification to the point at which all meaning is lost.

There is one cliche, however, that has changed my life—dramatically for the better. I first heard it as a youngster and its inherent truth has governed my perception of things through most of my life: "*It's all a matter of perspective.*" The implications of this statement are vast; all-pervasive. It not only means that there is more than one way to examine an object, situation, person or incident; it also implies that for each different way one approaches something, there is a new insight, some new information to be gleaned.

Writers of science fiction have always known this and been guided by this—even before someone labeled what they wrote as "science fiction." (That "someone," by the way, was Hugo Gernsbach, the American radio and electronics pioneer. Gernsbach is perhaps better known as the father of science-fiction pulp magazines.) In fact, that search for all of the different ways in which something can be viewed, the exploration of *all* of an event's ramifications, is often called "using the science-fiction perspective."

SF authors have another way of labeling it. They call it "asking the next question" or, more simply, the "what if" process. This is the essence, the heart, of true science fiction. It is the process through which new worlds are opened and explored. It is the reason that such things as atomic-powered submarines, airplanes, rockets, computers, transistors and orbiting space habitats were conceptualized and written about long before they became realities. The ability to think in this manner is the reason that so many visionary scientists have written such brilliant science-fiction stories.

It is not easy to cast aside a life's worth of socialization and unconscious programming in order to free one's mind for such unlimited thinking—but it can be done. To get there, one must immediately throw out all preconceived notions; prejudice is the bane of free thinking.

One dangerous assumption when approaching the limitless worlds of science fiction is that it is a limited genre. Limited to rayguns and spaceships; limited to bug-eyed monsters and evil aliens; limited to examining the future.

A perfect example is the marvelous 1950s film *The Man in the White Suit*, starring Alec Guinness. He portrays a British, working-class chemist, employed by Brinley's—a leading textile manufacturer. He is working at developing a new synthetic material that will be superior to the other blends already on the market. What he comes up with is the *perfect* fabric: it won't wear, tear, soil or age. In short, it is indestructible.

At first his employer, Mr. Brinley, is overjoyed. It will make him King of the textile world. Plans are made to announce the new product publicly and to go into production. Guinness is delighted. He will have made an important contribution to the welfare of all humanity.

But what of the ramifications? Word leaks out to other textile manufacturers and to the workers at Brinley's. Their reaction is quite different from that of the idealistic chemist. The workers fear that after they've produced the wonder cloth in sufficient quantity, their jobs will become superfluous. The other manufacturers feel that they, too, will quickly be put out of business. And the

Secretary of the Interior envisions massive unemployment and starvation, as the cotton and wool industries—from farmers and sheepherders to retailers and laundries—become irrelevant. They determine to stop Guinness from publicizing his "gift to humanity" at all costs. . . .

The film is a masterpiece of science fiction. The writer used classical SF methodology by posing a simple question: What if a perfect, indestructible cloth were invented? And then he went on to ask the next question: Would it be the boon to mankind that it so clearly seems to be on first thought? By following those questions through to their logical conclusions, the author came up with a perceptive insight into the nature of Man and his society. All of the action takes place in the "here-and-now;" no spaceships, no strange aliens, no other worlds or threatening monsters.

In FUTURE you will find what may be considered a strange mixture of elements for a "science-fiction magazine." In actuality, they are all different aspects of the same search. What we have done in this issue, and will continue to do, is to examine a single question, "What is the shape of tomorrow?" from as many perspectives as we can free ourselves to see. I hope that you will continue to join us in our quest.

Howard Zimmerman/Editor

FUTURE #2

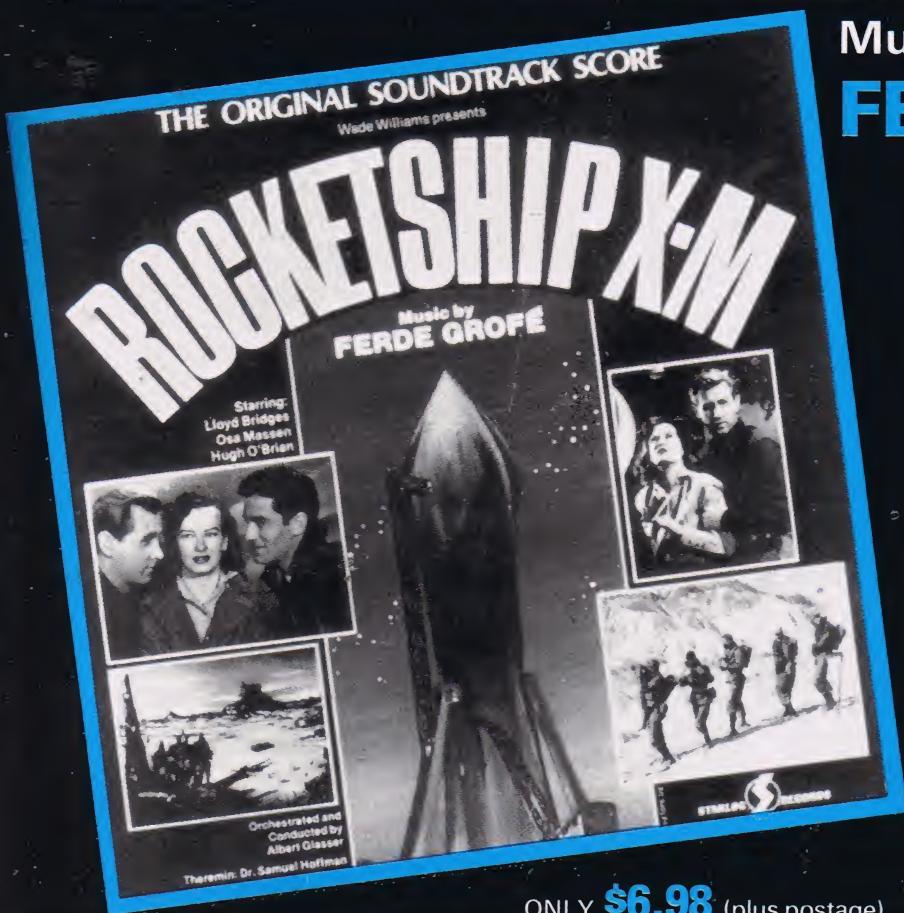
In addition to the second exciting installment of FUTURE's "Civilization in Space" series, a fascinating "Science Notebook" discussion, and a special celebrity vision of "Tomorrow," the next issue will feature a colorful portfolio from the Walt Disney space films, an interview with legendary scientist/writer Arthur C. Clarke and pages of fantastic new visual surprises!

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